672

DECEMBER 1955

# AMERICAN ARTISAN

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DEC 10 1955

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ATTENTION! ALL HEATING AND
AIR CONDITIONING TRADE!

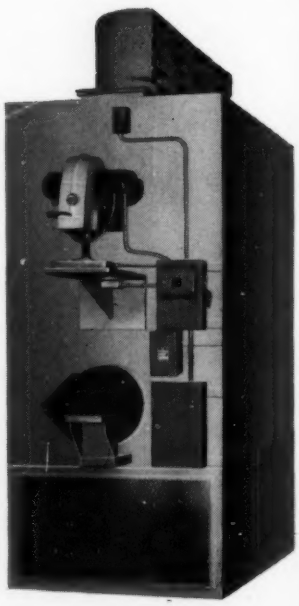
Newest addition to "America's Largest
and Most Complete Warm Air Heating Line."

# Jackson & Church DIRECT-FIRED UNIT HEATERS!

**Designed for industrial and commercial use, J-C direct-fired unit heaters are available in outputs from 400,000 to 2,000,000 Btu.** Versatile . . . efficient . . . can be used as a space heater with swivel type discharge nozzle and return air grills; as a heater with duct connection; as a heater for tempered air control.

J-C direct-fired unit heaters are self-contained, automatically controlled, equipped with integral air circulating blowers, and can be floor mounted or suspended. The heavy stainless steel airfoil combustion chamber eliminates refractory linings with their troublesome maintenance and replacement problems. The main air circulating blowers are double-width centrifugal type, selected for adequate air delivery with least power consumption.

Units are factory assembled, complete with wired control panel, burners installed and tested for gas, oil or dual-fuel. **You'll save three ways with a J-C DIRECT-FIRED UNIT HEATER . . . save on installation costs . . . save on fuel costs . . . save on maintenance costs!**



**Architects or Engineers desiring more information should contact Jackson & Church Furnace Division, Saginaw, Michigan.**

*America's largest and most complete warm air heating line.*

J-C **JACKSON & CHURCH** FURNACE DIVISION

SAGINAW, MICHIGAN

# ADELTA

***Outstanding Leadership in Design, Quality, Service, Performance***

NOW COMPLETELY CARTONED

**A COMPLETE LINE OF STANDARDIZED PIPE, DUCT, AND FITTINGS FOR ALL TYPES OF RESIDENTIAL HEATING AND AIR CONDITIONING INSTALLATIONS.**

***Write for General Catalog 55***

INDOOR COMFORT

## Adelta Manufacturing Company, Inc.

21st & Ellsworth Streets, Philadelphia 46, Pa.

ADI

# AMERICAN ARTISAN

## DECEMBER 1955

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*Founded 1864; Vol. 92 No. 12*

**RESIDENTIAL AIR CONDITIONING**
**WARM AIR HEATING**
**SHEET METAL CONTRACTING**

Merged with American Artisan are "Warm Air Heating" and "Furnaces and Sheet Metals"



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# Sales are turning greener every day

YOU'LL see it everywhere — the famous Mountain Spring Green that says, "Here's another Mueller Climatrol heating or cooling unit." Yes, and all these installations tell a profit story . . . show how easy it is to sell the all-'round superiority of Mueller Climatrol.

**Make it your great green line for '56.** Enjoy all the preselling benefits of a new, hard-hitting advertising program . . . see how the industry's most comprehensive practical sales promotion program helps you. Go to town with the world's most complete line of products for heating and cooling.

Write for facts. Mueller Climatrol, 2030 W. Oklahoma Avenue, Milwaukee 15, Wisconsin.

**Look for more in '56 with**

# Mueller Climatrol

**HEATING and COOLING**

98th Anniversary

NEARLY 100 YEARS OF MANUFACTURING QUALITY COMFORT EQUIPMENT

## the editor's notebook

### *Thumbing Through This Month's Artisan*

. . . we watch a selling message chalk up heating and cooling system sales via TV when a Sioux City *Dealer Gets in the Act* to utilize his knowledge of warm air heating and air conditioning in presenting a convincing sales pitch punctuated by demonstrations. We find out that performing before the cameras is not as terrifying an experience as it may seem and we watch the promotion idea bear fruit as leads and sales assume record proportions. We watch the scheme develop and follow it through trial stages to the point where it takes three men to follow up the leads developed in sponsorship of a weekly news program.

### Power

. . . and we get a rundown on a nebulous term which is taking on increased importance to air conditioning dealers, with electrical engineer Lee Wilcoxon in *Power Factor — What's That?* This month's "'training program' . . . in print" article, presented to help dealers and contractors train their employees in all phases of the business, defines power factor and illustrates its effect on the dealer's installations. Developing an understanding of the factor through a review of fundamentals of electricity, we can appreciate the value of a working familiarity with electricity which may not have been necessary prior to the air conditioning "boom."

### Gravity

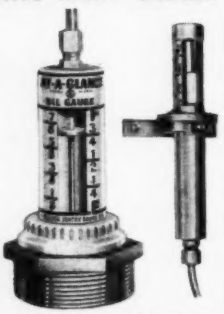
. . . we investigate, under test conditions, the

INCREASE EQUIPMENT SALES
...cut down delivery costs
Sentry ODF* Tank Gauge tells drivers what they want to know
at point of delivery!
"THAT LITTLE SENTRY GAUGE SURE SAVES US BOTH A LOT OF TROUBLE!"
TELLS WHEN OIL IS NEEDED
*Oil Dealer's Friend
. . . HOW MUCH IS NEEDED
. . . WHEN TO STOP FILLING
STOP FILLING
Sentry "ODF" remote reading gauge

ONLY Sentry OFFERS SUCH A COMPLETE LINE OF DIRECT AND REMOTE READING TANK GAUGES

Above is SENTRY'S newest — The ODF At-A-Glance tank gauge that's setting new records in building sales and customer goodwill. Located outside of building at fill pipe, this easy-to-read weather-proof gauge shows the exact oil level in the indoor tank. Saves costly time consuming trips to basement, unnecessary hose unreeling and eliminates over-flow. Permits delivery without disturbing customer.

Other constant-register SENTRY gauges include combination tank and remote reading, barrel gauges, direct reading, and gauges for stove and space heater tank. Write today for full information about these fast moving business getters. Advertising aids available.


Combination At-A-Glance tank and remote reading gauges

Sentry stove and space heater gauges
Sentry At-A-Glance barrel gauges
On guard— 24 hours a day
Sentry At-A-Glance tank gauge
Sentry superior quality Therma-Gauge

KRUEGER Sentry GAUGES
GREEN BAY · WISCONSIN


## the editor's notebook

(Continued)

performance of a gas fired gravity furnace in a basementless residence in the article, *Here Are New Facts on Gravity Heating*, based on the findings of the National Bureau of Standards under sponsorship of FHA, resulting from tests conducted to determine the adequacy of temperature distribution using this type of heating. We follow the test procedures to establish distribution patterns which show the advantages and limitations in various climates and under different arrangements.

### Aluminum

. . . and we find that *Basic Rules Govern Shearing Techniques for Sheet Aluminum* with author G. W. Birdsall who recommends a familiarity with the properties of aluminum as a basis for good shearing and sawing techniques using standard shop equipment. We find that with reasonably careful handling procedures and observance of proper clearances and saw speeds, equally as good results can be obtained with sheet aluminum as with other sheet metal products.

### *'What Price Volume If Profits Are Low?'*

ROCHESTER, N. Y. dealer Richard W. Friday had this to say in a bulletin to members of the Master Sheet Metal, Furnace and Roofers Association of Rochester: "There are only so many heating units sold each year regardless of price, and you can't sell them all anyway. So why not jack up that quotation to give you the profit you are entitled to? We will admit you may

# Generals COVER THE FIELD

## For Full-Line Heating Profits!

### HUMIDIFIERS

**Two-Piece**
**MODEL 250**

The most unique warm air furnace humidifier ever offered! Eliminates plates, overflow lines, floats and needle valves. Nothing to stick, clog or cause trouble! Hydro-Flow Regulator filters, measures and replenishes water as it evaporates from separate pan — mounted on heat exchanger where air is hottest. Recommended for large capacity furnaces and for deluxe humidification.

**JUST INTRODUCED!**
***Unit Type***
**MODEL 200**

This new unit-type warm air furnace humidifier requires the *smallest* plenum opening of any humidifier on the market — just 3¼"x3⅝"! An exclusive leveling feature automatically adjusts balance, water level and line pressure of the "200"—in straight or sloping plenums. Installation time is reduced to a minimum! Porosil "porous weave" ceramic evaporating plates resist calcifying action and contain better capillary qualities than any other known material.

### FUEL OIL FILTERS

**MODEL 1A-25A**

***Small Homes, Space, or Water Heaters***
- Step-Design Wool Felt Cartridge
- Cast iron cap, steel bowl
- 3⅝" dia. — 5⅛" high
- 41 sq. in. filter unit surface
- ⅜" or ¼" pipe openings

**MODEL 2A-700A**

***Average Size and Large Homes***
- Step-Design Wool Felt Cartridge
- New, improved leakproof seal
- 4⅜" dia. — 6½" high
- 83 sq. in. filter unit surface
- ⅜" or ½" pipe openings

**MODEL 2A-300**

***Deluxe Filter for Extra Dirty Tanks***
- Metal encased, "depth type" cartridge
- Big 63 cu. in. filter unit surface
- Leakproof screw-type steel handle
- 5½" dia. — 9⅛" high
- ⅜" pipe openings

**MODEL 2A-17**

***Heavy Oils Nos. 4, 5, or 6***
- Cleanable Monel mesh screen
- Lifetime cap-bowl construction
- Economy of using heavy oils
- Single bolt assembly
- Gravity or pressure type burners

### HEATING ACCESSORIES

**CLEAN RIGHT SOOT REMOVER**

***For Any Heating Plant — Oil, Gas, Coal or Wood***

Cuts heating costs as much as 25% by removing up to ½" layer of soot in 2-5 minutes without flash or intense heat. Non-corrosive, non-explosive. Simple and inexpensive to use. Complete directions on package.

**MODEL 90 WATER TRAP**

Designed for bottom or side outlet fuel oil storage tanks. Removes water from oil before it reaches filter; protects filter, nozzle, and pump. Contains interchangeable ⅜" inlet-outlet and ¾" threaded brass drain plug.

**OUTSTANDING PRODUCTS OF**

**GENERAL FILTERS, INC.**
**43800 Grand River Avenue, Novi, Michigan**
In Canada: Canadian General Filters, Ltd., 39 Crockford Blvd., Scarborough (Toronto 16), Ontario

## the editor's notebook

*(continued)*

lose a few jobs, but what good is a big volume without a profit? Forget about your competitor's prices. When he gets loaded up with low price jobs, you can take the cream of the crop and make some money."

This makes sense to me and I believe that when the low price shops find they are trading dollars with customers, the example recommended by Mr. Friday will upgrade the industry all along the line.

### *Bigger and Better Prizes for TV*

I'VE BEEN wondering how long it would be before the sponsors of TV programs that present their contestants with awards would wake up and give something really useful. Of course there's the $64,000 question and the Cadillac consolation present, but, in the main, most of the presents given are of the glamour type rather than the serviccable variety. For my money, "Truth or Consequences" has found the ideal present for those people cooperating with them.

On Nov. 11, a Mr. Johnson of Houston was the unsuspecting host in a prearranged police raid on his home. For his exemplary conduct during such a nerve racking experience, he was given a year 'round air conditioning system. This is something that makes having been part of such a program a real pleasure day in and day out, 12 months a year. Let's hope the practice of giving this kind of present continues and on a wide scale.

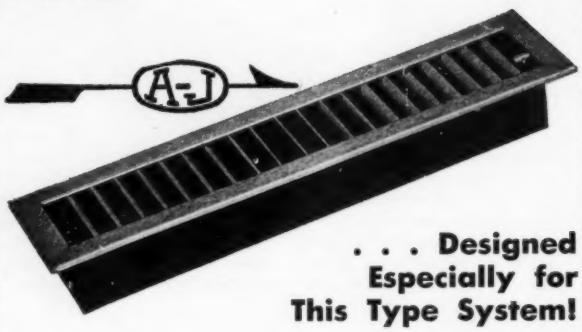
### *Sees Price Rise For Cooling Equipment*

THIS SUMMER'S heat wave had considerable effect on the


● *ARE YOU INTERESTED IN*

# PERIMETER HEATING?

**Here's a New Diffuser REGISTER . . .**




**. . . Designed Especially for This Type System!**

This diffusing type floor register was carefully engineered, in cooperation with heating specialists, to provide the answer for a perfect outlet for perimeter heat!

It's ruggedly constructed. The heavy gauge curved vanes are factory-set to deliver a uniform fan-shaped pattern of air to cover the window areas or cold outer walls.

The 4" and 6" width have multiple louvers. The 2¼" width has a single louver, embossed for greater rigidity. A special lock screw allows you to set the valve louvers so they cannot be opened beyond the desired position after system is balanced. Louvers close tightly to completely shut off air flow when desired.

**AVAILABLE IN EIGHT SIZES!**

| | | | |
|---|---|---|---|
| 12 x 2¼ | 10 x 4 | 12 x 4 | 14 x 4 |
| 14 x 2¼ | 10 x 6 | 12 x 6 | 14 x 6 |

**CHOICE OF FINISHES**

A-J Perimeter Registers may be ordered in any of these finishes: Gray Prime, Gray Hammertone, Bronze Hammertone, Black Japan, Golden Oak or White Japan.

**YOU'LL USE IT MANY PLACES!**

The narrow width of this register makes it ideal for numerous installations other than perimeter heating. For instance: In stair risers, under kitchen cabinets, in sills of picture windows. It may also be used as a side wall outlet with high velocity system. It is *vibration-free!*

Write for our Complete **FREE CATALOG** Listing Over 1000 Types and Sizes of Grilles and Registers for Every Need!

**A — J**

**Manufacturing Co.**

Dept. A-12

3601 E. 18th Street

Kansas City 27 Missouri


## the editor's notebook

*(continued)*

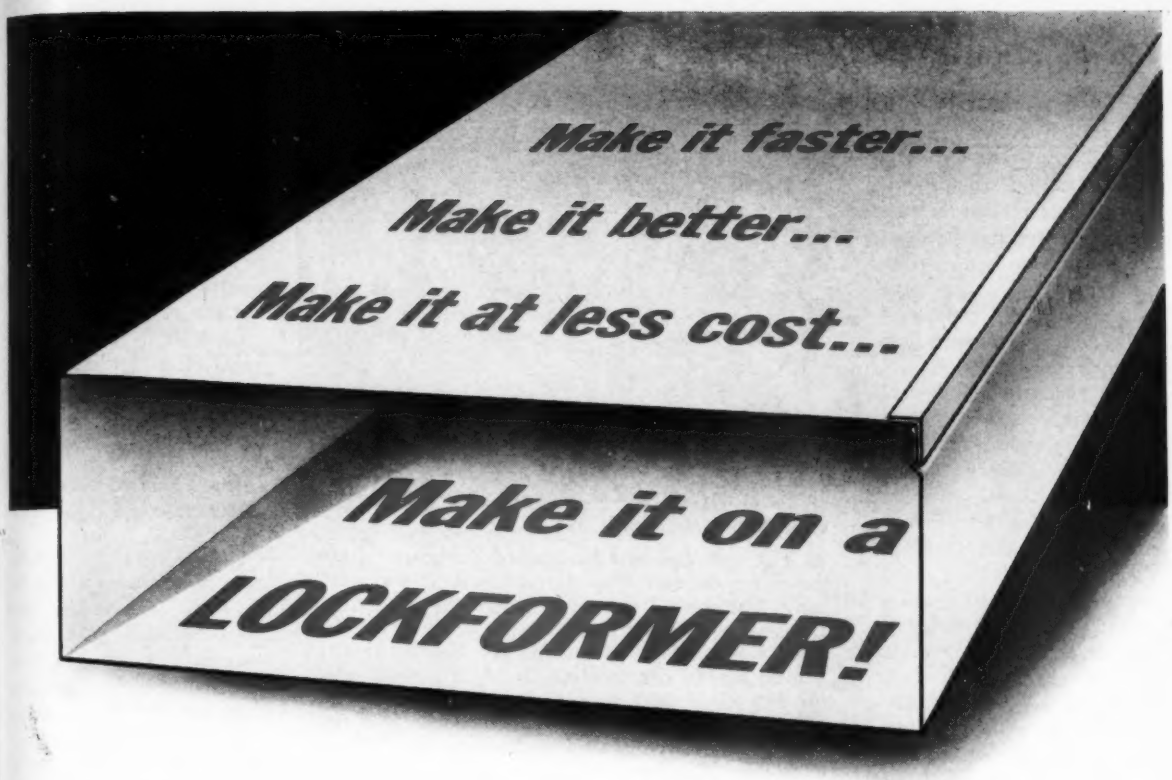
buying habits of the American public. Anything that could provide any degree of relief was sold. Manufacturers of fans, window air conditioners, evaporative coolers and central systems all report record breaking sales. S. J. Levine, General Electric Co., wrote me that he expects industry sales of central systems to show at least a 50 percent increase during 1955 and that 1956 should show similar increases. He added a note of caution about manufacturers' price increases that will affect dealer bids. It appears that the added costs of labor and basic materials that have been absorbed at the manufacturing level will be passed along to the dealer with next year's models. Watch your proposals — make sure that old prices aren't used in making quotations.

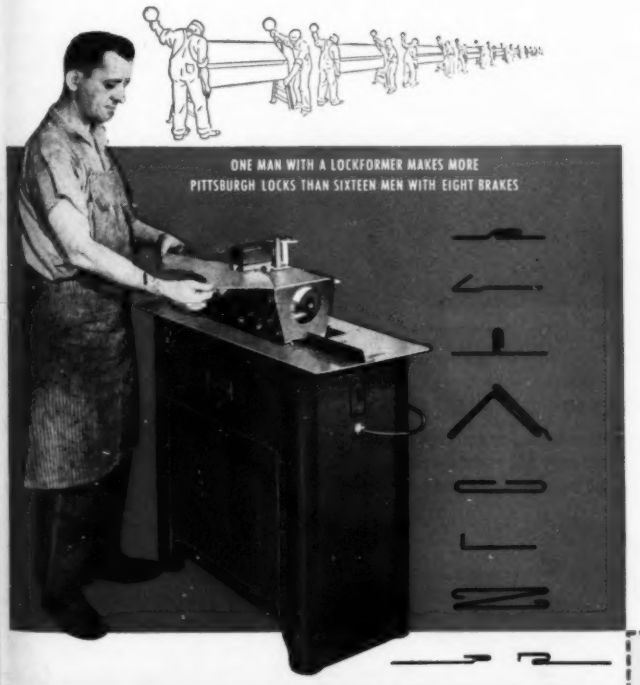
### *Fuel Lines Clogged? New Solvent Reported*

FROM OIL HEAT Institute comes good news about a new compound that has been developed to dissolve the fuel line-clogging jelly that occasionally plagues heating service men in various sections of the country. The new compound is not being produced commercially at this time, but if you have been having trouble of this kind, let me know and I'll arrange to have samples made available through the oil company research laboratory. It's said that the new compound dissolves the line-clogging jelly completely.

### *Buyer Discusses Sales Approaches*

ALL OF US are familiar with the extensive services performed by Dun & Bradstreet but one of the little known




**THE LOCKFORMER CO.**
4615 WEST ROOSEVELT ROAD · CHICAGO 50, ILLINOIS

Lockformers make Pittsburghs fifteen times as fast as hand methods . . . make standing seams, double seams (acme) drive cleats, right angle flanges and other shapes with similar speed.

The fact that most shops have *two* or *more* Lockformers is substantial proof of their universal acceptance. Lockformers cost so little—save so much—it just doesn't pay to have men "waiting" to use them. Check your shop against the latest Lockformer Catalog. Use the coupon.

**LOCKFORMER CO.,**
**4615 WEST ROOSEVELT ROAD, CHICAGO 50, ILLINOIS**
*Send catalog to:*

NAME_____

FIRM NAME_____

ADDRESS _____

CITY_____ STATE_____

## the editor's notebook

*(continued)*

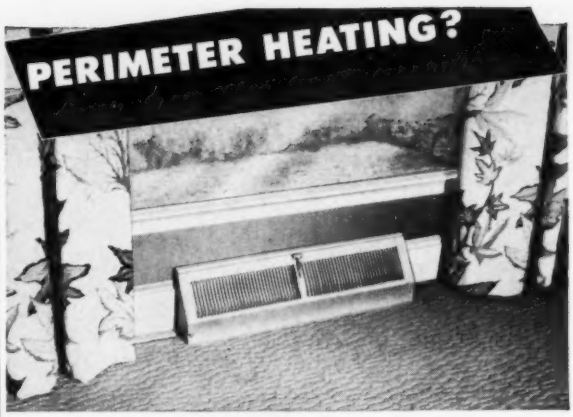
activities of this company is its continuous effort to pass along business aids to management. Recently the company prepared a 29 page booklet entitled "Some Do's and Don'ts of Selling as One Buyer Sees Them."

The author points out some of the characteristics of salesmen who had called on him and comes up with some of the points that influenced him to give orders to some and to turn others down. You'll find the advice given very helpful to your salesmen. Dun & Bradstreet, 99 Church St., New York 8, N.Y. is charging 25c each but if the suggestions made in the booklet are followed, this investment can be returned many thousands of times.

### *Government Offers Aid In Apprentice Training*

BENJAMIN FRANKLIN said: "He who hath a trade, hath an estate." Sometimes each of us tends to doubt this wise man's comments, but I believe that the training I have received in this field has given me an estate and that the least I can do is pass along some of the things I've learned from others. This is also the theory upon which the U.S. Department of Labor's Bureau of Apprenticeship is founded. Mr. W. F. Patterson, Director of the Bureau of Apprenticeship, recently sent me a letter asking me to tell dealer-contractors about his willingness to aid in obtaining and training apprentices for our industry. Among the statements Mr. Patterson made are these:

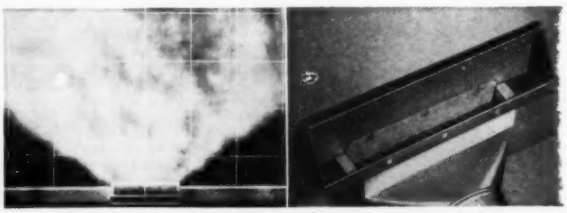
"One of the important advancements in apprenticeship has been the adoption of aptitude and qualification tests for entrance.


Auer "Perfusaire" TRADE-MARK

● The new *low-cost* baseboard decorator style perimeter diffuser illustrated above is only 18" long, but with a capacity of 4 to 8 foot units. Designed for easy installation in or against plastered walls, inside or outside the baseboard and in new or old construction. It has a pre-cut hole for 2¼ x 12" duct openings and knock-outs to accommodate 2¼ x 14" where needed. It is the answer to uneven wall installations—so difficult with long diffusers.

"Perfusaire" distributes air evenly over a wide fan-shaped area, and is equipped with a built-in damper for system balancing. It is an ideal unit for combination heating and cooling systems.

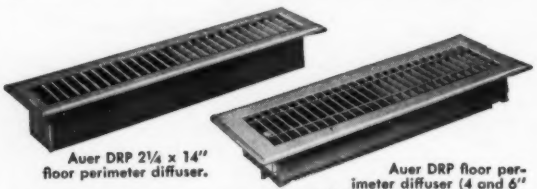


Auer "Perfusaire" test photo showing huge fan-shaped air pattern, ideal for heating and combination heating and cooling systems.

Clip fasteners permit a means of attaching 2¼ x 12" or 2¼ x 14" duct without cutting the diffuser.

FLOOR TYPE

For floor type perimeter and intricate "narrow-space" installations, Auer can fill your needs from its complete "DRP" line of registers in standard sizes.



Auer DRP 2¼ x 14" floor perimeter diffuser.

Auer DRP floor perimeter diffuser (4 and 6" widths, 10, 12 and 14" lengths).

*Write for full details on low cost "Perfusaire" and other perimeter diffusers. Ask for Bulletin P-54.*

Auer REGISTERS and GRILLES

THE AUER REGISTER CO.

6602 Clement Ave. • Cleveland 5, Ohio


## the editor's notebook

*(continued)*

"The perpetuation of skills through transfer to a younger generation should not be left to happenstance.

"Apprentice training—the keystone of craftsmanship."

I like these points of view and feel sure that you do, too.

### *Study Plans to Aid Flood Victims*

THE TWO recent floods (August and October) that hit the New England area have brought immediate long-range financing to damaged business and residential holdings closer to a reality, according to FHA Commissioner Norman P. Mason. Every assistance possible was given the communities hit in the stricken areas, but a plan whereby losses incurred through future rampages of nature can be quickly overcome by proper financing is being formulated and will relieve the suffering and aid recovery of the stricken areas. This new plan is now under formation and will, when completed, be a great emergency tool for use any place in the nation.

### *Robot Units to Brighten Home Life of Future*

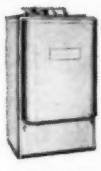
DON'T DESPAIR, there's relief coming, fellows. The pressure of keeping the customer happy is going to be lifted. This is, of course, in the future, not this winter when at 2:00 a.m. some frozen customer calls and wants a serviceman right now. But it is possible that jangled nerves, frayed tempers and insomnia will be the exception rather than the rule in American homes of the future. This interesting information comes from Finn J. Larsen, research director,

# Luxaire® UNITS

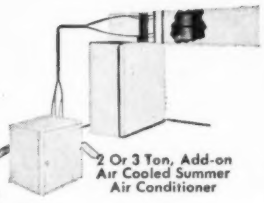
## Have a "REPUTATION" for Excellence
## . . . for Trouble-Free Performance

## YET...they cost no more!

5 Ton Year 'Round Air Conditioner


2 Or 3 Ton Basement-Utility Year 'Round Air Conditioner

2 Or 3 Ton Counterflow Year 'Round Air Conditioner


2 Or 3 Ton, Add-on Air Cooled Summer Air Conditioner

2, 3 Or 5 Ton Water Cooled Summer Air Conditioner

Gas Or Oil Basement Winter Air Conditioner

Gas or Oil Utility Unit

Gas or Oil Gravity Furnace

Incinerator With or Without Gas Burner

Gas Fired Unit Heater

Gas and Oil Horizontal Furnaces

Gas or Oil Counterflow Unit

**A UNIT FOR ANY JOB**

**Most Furnaces Burn EITHER GAS or OIL**

**. . . . with EVERY UNIT COMPETITIVE in PRICE**

**Why?**

Start with the Cabinet. It's attractive — with gracefully rounded corners and a mar-resistant, glossy baked enamel finish. It's rigid — of heavy gauge steel. It's tight — with a sturdy steel floor for which no grouting is required.

Consider the Heat Exchanger: It's durable — of heavy gauge steel, welded into a single, leak-proof, gas-tight unit that is free of expansion and contraction noises. The efficient, cylindrical design conforms to the natural shape of the heating flame, permitting interchangeable use of either an oil or gas burner.

The improved, single-port Luxaire Gas Burner is clean burning and trouble-free. The gas regulator is equipped with an ingenious STEPFLOW device with a slow opening feature for smooth, gradual, silent ignition.

The pressure atomizing Luxaire Oil Burner is exceptionally quiet, efficient and economical — a dynamically balanced unit that assures less maintenance, longer life.

For Cooling, Luxaire units are both air cooled and water cooled — both types charged with Freon and Hermetically Sealed at the factory.

**Yet, volume manufacturing with efficient production methods keeps your cost exceptionally low!**

Why not start gaining **your reputation, now** — with Luxaire? See your Luxaire jobber!

**THE Luxaire® C. A. OLSEN MANUFACTURING COMPANY . . ELYRIA, OHIO**

**HEATING & AIR CONDITIONING UNITS**

## the editor's notebook

*(continued)*

Minneapolis-Honeywell Regulator Co., who says that the automatic control of bedroom temperatures through the use of robot units will result in better, sounder sleep, with the result that everyone using this type of control system will experience more favorable reactions and physical well-being and have better control over their emotions.

### *Says Cutting Profits Only Invites Trouble*

IN SEPTEMBER American Artisan published an editorial entitled "Price Cutting — A Poor Substitute for Sales." We've had numerous requests for extra copies and have supplied several thousand reprints in response to separate orders. The acceptance accorded my points of view is very gratifying and I was pleased to read what Frank F. Elliott, president, Crane Co., told the delegates attending the Fourth Annual Convention of the American Institute of Wholesale Plumbing and Heating Supply Associations in New York on September 21. Mr. Elliott said, "Keeping up with the times — and with the competition — by cutting your profits by the same margin as someone else, is to invite trouble. You shouldn't let the other fellow decide what you can sell for or how your business should be run any more than you should set your watch by his; he may be wrong."

Mr. Elliott's advice could be a good thought for the day — today and every day.

### *Keeping Up With Competition*

A SHORT time ago, I made a social call on the F. O. Schoedinger Co., Columbus, O., wholesaler, and while passing through their main office I noticed this reminder, "Competition is getting keener — are you?"

New production machinery of our own exclusive design, now enables us to produce button type Elgen All-Tite vane runners in continuous coils, effecting a savings in your cost per job.

**COILED ELGEN ALL-TITE VANE RUNNERS MEANS . . .**

- *Less Waste!* Waste pieces due to short ends are a thing of the past. Vane runner metal is coiled in 100 foot lengths, you just pull out the exact footage needed.
- *Easier Storage!* Each coil weighs approximately 50 lbs. and is packed in a box 28" x 28" x 5". Box fits easily under bench or against wall.
- *Easier Handling!* No loose pieces lying around to get in the way or collect dirt.
- *Unrolls absolutely flat!* Vane runner metal emerges from the box at bench height . . . absolutely flat . . . ready for use.

**TWO MORE ENGINEER-APPROVED ELGEN PRODUCTS THAT SAVE YOU TIME AND MONEY**

**ELGEN SILENT DUCT**

. . . for forming "flexible" duct connectors. A one piece metal to material unit, packed in coils, unrolls absolutely flat. Makes on the spot work a cinch.

**ELGEN DAMPERSET**

. . . for multi-blade dampers, parallel or opposed. Most perfect damper hardware developed.

**ELGEN PRODUCTS ARE SOLD THROUGH LEADING JOBBERS EVERYWHERE.**

*Write today for free catalog and "spec" sheet!*

**ELGEN MANUFACTURING CORP.**

41-34 39th Street, Long Island City 4, N. Y. Dept. A-12

## the editor's notebook

*(continued)*

### *Split-Level Houses Need Larger Furnaces*

TRENDS in contemporary houses seem to be toward the split-level type, and the latest innovation to make the living room seem larger is to raise the ceiling to the one-and-a-half level — in some cases, to the second floor level. Now this is all right with us in the heating industry, but house builders must recognize that a six or seven room house of this type is going to need a larger furnace and, in some cases, a different type of air distribution pattern. Don't overlook the hidden problems of added return air and, in many cases, the extra return openings necessary when you are bidding on split-level houses.

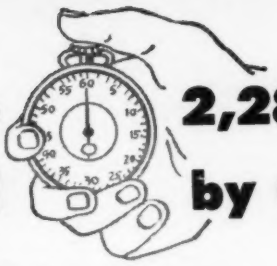
### *Gives New Definition of "Automation"*

I LIKED the definition given of the word "automation" by Roger H. Corbetta, president, Corbetta Construction Co., Inc., who recently said, "The word 'automation' is still too new to be found in current dictionaries; those who know most about it do not agree on its definition, but there is no question about its importance." After quoting a number of well-known people who have discoursed on the subject to some extent, Mr. Corbetta said, 'automation' is just another way of spelling 'imagination'."

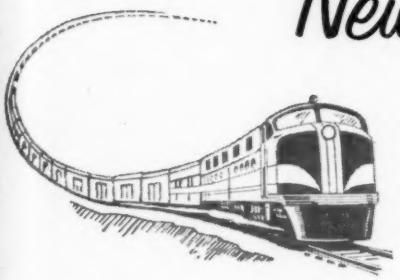
*Clyde M. Barnes*

EDITOR

# Every minute handled 2,281,623 cu. ft. of air by CLARAGE in



## New York's new Coliseum



## ...enough to fill a train of boxcars 5½ miles long

One of the biggest air handling assignments on record — and Clarage all the way!

For the Coliseum's colossal requirements, 75 Clarage Fans, 24 Unicoil Sprayed Coil Units, and 14 Multitherm Conditioning Units were selected. This choice, we feel, is an outstanding tribute to the worth of our equipment. Obviously, in a structure of this type, there could be no compromise with quality. Only the finest could qualify.

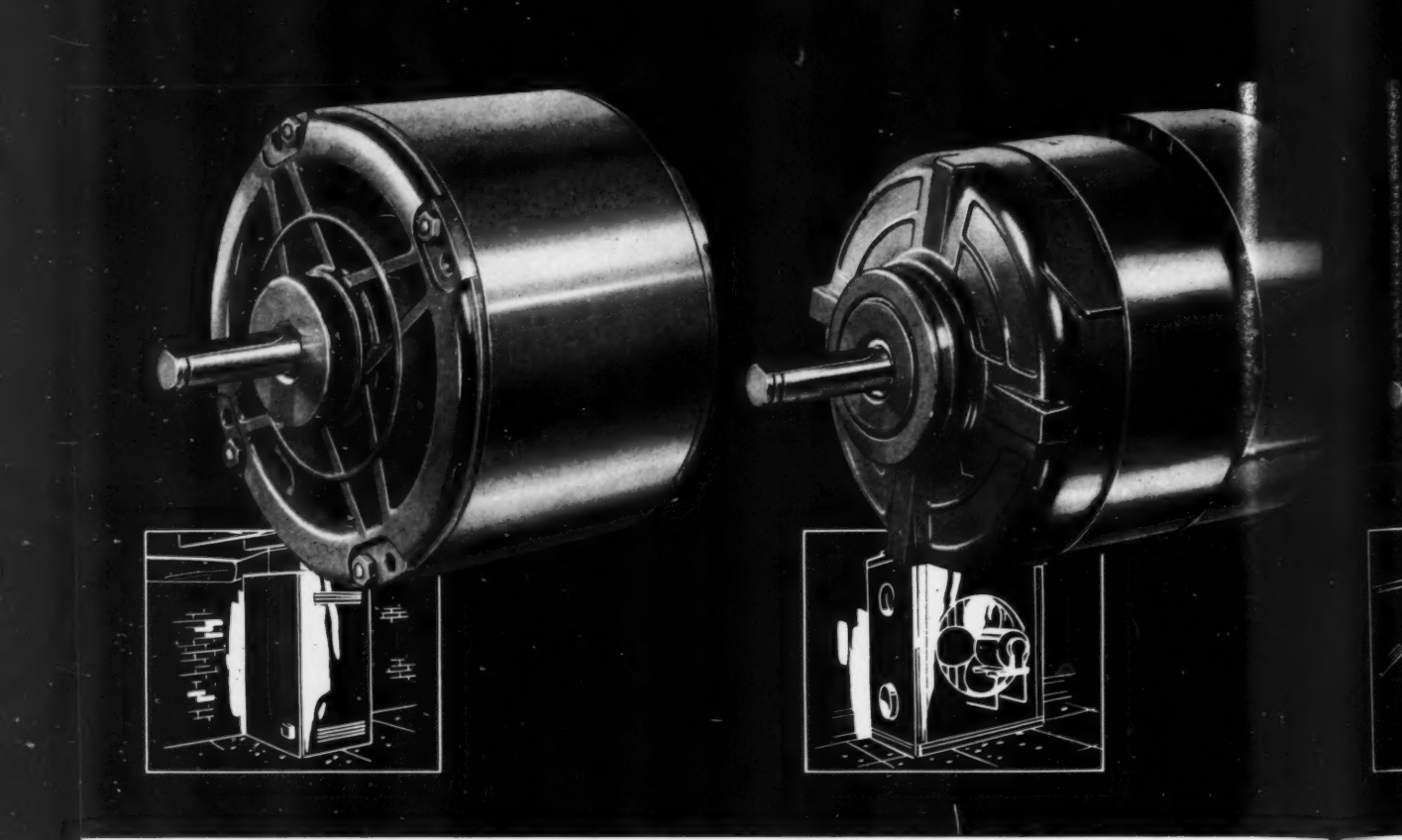
Make sure *your* investment in air handling and conditioning is a profitable one. Investigate the equipment we have perfected for every type of application.

CLARAGE FAN CO., Kalamazoo, Michigan

OWNER — Triborough Bridge & Tunnel Authority
ARCHITECT — Leon and Lionel Levy
MECHANICAL ENGINEER — Guy B. Panero
STRUCTURAL ENGINEER — Dr. Jacob Feld
GENERAL CONTRACTOR — Walsh-Fuller-Slattery
HEATING, VENTILATING AND AIR CONDITIONING CONTRACTOR — Almirall & Co., Inc.

**CLARAGE** ... *dependable equipment for making air your servant*

SALES ENGINEERING OFFICES IN ALL PRINCIPAL CITIES • IN CANADA: Canada Fans, Ltd., 4285 Richelieu St., Montreal

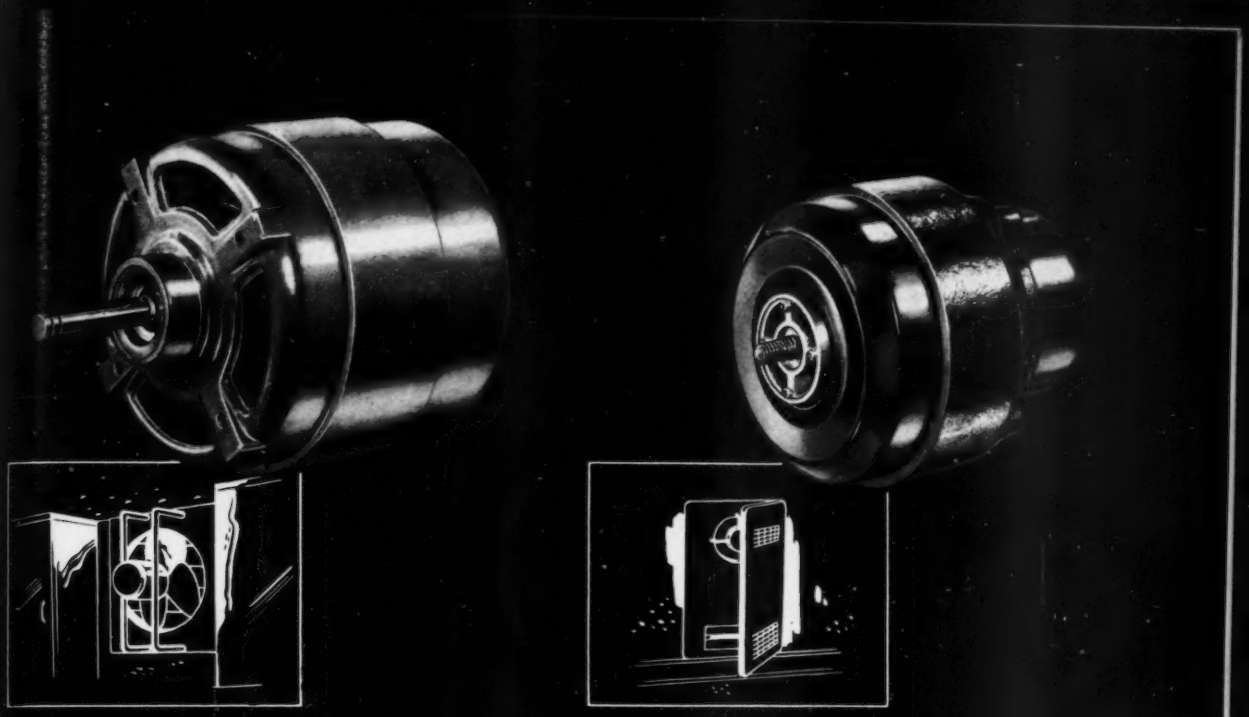


**1/12 TO 1/4 HP** for remote air conditioners, direct-drive furnace blowers up to 115,000 BTU output, roof ventilators, window fans. Open and totally enclosed models available; single rotation and reversible; 1050 and 1550 rpm.

**25 MHP TO 1/12 HP** for such products as large window fans, large unit heaters, small direct-drive furnace blowers. Motor can be supplied totally enclosed and totally enclosed fan-cooled depending on rating; 1050 and 1550 rpm.

# Rating for rating, G-E shaded-pole

**CREATIVE ENGINEERING—A WAY TO BETTER PRODUCTS—** G-E motor application engineers are specialists in creative engineering. Working directly with your design people, they can often suggest new opportunities to streamline your products by taking full advantage of G-E shaded-pole motor features. Put them to work on your motor-application problem.



**15 TO 35 MHP** for such products as medium-sized unit heaters, small window fans, ventilator fans. Motor can be supplied totally enclosed fan-cooled for gas-fired unit heaters, and can be mounted from either end; 1050 and 1550 rpm.

**1.5 TO 16 WATTS** for such products as small unit and space heaters up to 74,000 BTU output. Motors are totally enclosed and of rugged construction. Shaft is threaded for direct connection of fan. Available in 1050 and 1550 rpm ratings.

# motors are designed and built to keep your costs low, quality high

If you build air-moving equipment of most any type, there is a General Electric shaded-pole motor especially suited to your product. Information on application, types of enclosures available, superior construction features, and ratings are provided above. Now check other reasons why air-moving equipment manufacturers prefer G-E shaded-pole motors.

### QUALITY FEATURES MEAN TOP PERFORMANCE

**Long-life bearings**—G-E shaded-pole motors bring you the benefits of sealed-in lubrication. Oil grooves in shaft provide positive lubrication of filtered oil to bearing surfaces.

**Cooler operation**—Improved ventilation of G-E shaded-pole motors results in longer life through cooler bearings and windings. Higher efficiency (lower heat loss) of 1/12- to 1/4-hp line simplifies provision for motor ventilation in your products.

**Unit-bearing** in smaller ratings and two-bearing design in 1/12- to 1/4-hp line each provide the optimum in compactness, quietness, and long life.

### VERSATILITY MINIMIZES DESIGN COSTS

**All-angle operation** provided by sealed-in lubrication and advanced bearing designs permits mounting motors shaft up, down, or at any angle. All-angle operation permits you to make maximum use of space, cut product weight and save on material costs.

**Three-way mounting** is offered on most G-E shaded-pole motors: cushion end-rings, through-bolts, resilient cradle bases. Extra-high bases are also available to match your design needs.

**FOR COMPLETE SHADED-POLE MOTOR SERVICE,** including expert application help, contact your G-E Apparatus Sales Office. Write for Bulletin to Section 704-56, General Electric Co., Schenectady, N. Y.

*Progress Is Our Most Important Product*

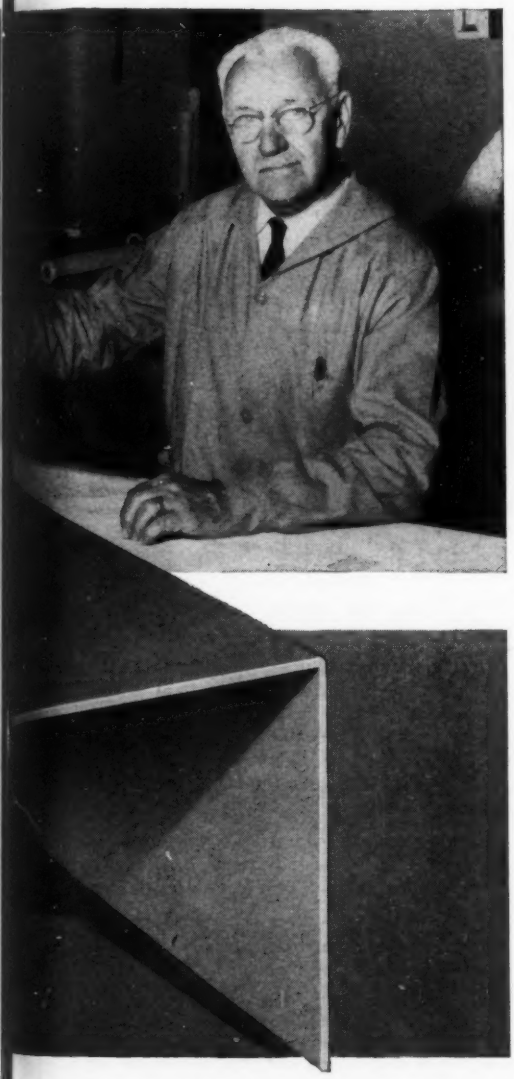
GENERAL ELECTRIC

# "It's easy we've

**What other metal can give you the corrosion resistance, durability and lustrous beauty of Stainless Steel?**

**This will be part of a Stainless Steel water fountain. Notice the neat smooth welds.**

# to fabricate **Stainless Steel**—
# been doing it for 25 years"



*says George Melcher, Chief Designer, Flour City Ornamental Iron Company, Minneapolis, Minnesota*

**In 1893,** the year of the great Chicago Exposition, Eugene Tetzlaff leased a former stable in Minneapolis. With a forge and an anvil, using his own hands, he beat out a sign that said "Flour City Ornamental Works."

Almost immediately, the little company began landing some important contracts. In 1902, they furnished all the ornamental work for Minnesota's monumental capitol building. Since then, they have ranged the nation, winning such contracts as the Philadelphia International Airport, the Texas National Bank and the Mayo Diagnostic Unit. Over 700 employees are on the job.

According to Chief Designer George Melcher (with the company 43 years), they started using Stainless Steel back in 1930, and it has played an increasing role in their production ever since. Production difficulties? None. In fact, these craftsmen turn out custom products that might be accurately described as industrial sculptures in Stainless Steel.

*When buying Stainless Steel,* remember this: United States Steel offers the greatest range of grades, sizes, types and finishes available in the country.

UNITED STATES STEEL CORPORATION, PITTSBURGH · AMERICAN STEEL & WIRE DIVISION, CLEVELAND · COLUMBIA-GENEVA STEEL DIVISION, SAN FRANCISCO
NATIONAL TUBE DIVISION, PITTSBURGH · TENNESSEE COAL & IRON DIVISION, FAIRFIELD, ALA. · UNITED STATES STEEL SUPPLY DIVISION, WAREHOUSE DISTRIBUTORS
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

**USS STAINLESS STEEL**

SHEETS · STRIP · PLATES · BARS · BILLETS · PIPE · TUBES · WIRE · SPECIAL SECTIONS

USS

UNITED STATES STEEL

# Insist on the New *Classic* Thermostat...

**Get Accurate Heating Control**
**Attractive, Modern Styling**
**Easy, Inexpensive Installation**

**Install DETROIT CONTROLS'**

**New *Classic* Thermostat**

**for Customer Satisfaction!**

The Classic will add style and saleability to the heating systems you manufacture, sell or install.

Its smart, modern design will complement the decoration of any home, new or old. The single, large numbered dial is slanted for perfect vision—can be read at a glance! The temperature selector is directly under the indicator needle—eliminates fumbling with old-fashioned turning or twisting devices.

Installation is very simple. No precision levelling is necessary. The Classic requires only two wires—easily replaces any two or three wire thermostat of earlier design.

Close control of any type heating, within a *fraction of a degree,* is assured by Detroit Controls' Timed Cycling function.

National advertising in Better Homes & Gardens, Small Homes Guide, Home Modernizing and other magazines will bring broad consumer acceptance to the Thermostyled Classic.

**DETROIT CONTROLS**
CORPORATION

8900 TRUMBULL AVE. • DETROIT 8, MICHIGAN
Division of AMERICAN RADIATOR & STANDARD SANITARY Corporation

Representatives in Principal Cities—Canadian Representatives:
RAILWAY AND ENGINEERING SPECIALTIES, LTD.,
Montreal, Toronto, Winnipeg

***Take Advantage of this opportunity...***

**SELL THE *Classic***

**AUTOMATIC CONTROLS for DOMESTIC HEATING • AIR CONDITIONING • REFRIGERATION • AVIATION • TRANSPORTATION • HOME APPLIANCES • INDUSTRIAL USES**

## Sees 12 Million Homes Built in Next 10 Years

"DURING the next 10 years the American economy will pour some $600 billion into building materials and construction labor and services. In the same period, somewhere in the neighborhood of 12 to 13 million new housing units will be built." These predictions were made by Dr. George Cline Smith, economist for F. W. Dodge Corp., at the annual fall meeting of the Producers' Council, Inc., a national organization of manufacturers of building materials and other equipment used in making a factory or a house suitable for those who will occupy the structure.

Dr. Smith told the audience he estimated that $450 billion would be spent for new construction in the coming decade, and that although adequate figures on the present level of maintenance and repair construction are not available, $150 billion seemed to be a minimum estimate for that category, making a total construction outlay of $600 billion. "This forecast," he said, "is conservative. It does not anticipate any construction boom, but simply a normal growth in line with the expansion of the nation."

Speaking on the subject of home building, he said: "Some idea of the basic demand may be gathered from the fact that net nonfarm household formations in the past year are estimated at more than 800,000 and that some 300,000 to 400,000 housing units are estimated to be withdrawn from the market each year. Nonfarm household formations should begin to rise substantially after 1960. While many other factors influence housing demand, the pressure of these household formations combined with the disappearance of existing housing through demolition, destruction, and conversion should provide a basic annual market for 1,200,000 to 1,300,000 housing units a year during the next decade."

# To Study Heating, Cooling At Housing Research Center

PLANS are in progress for the construction of a housing display and research village near Grand Rapids, Mich. where the building and associated industries can display, examine and evaluate their products as applied in complete homes. New concepts in heating and air conditioning will be studied at the center, and new equipment will be tested and displayed as it becomes available. Designated *Homestyle Center*, the village will contain houses of traditional, modern and experimental designs which will be heated and cooled by various types of systems. Fifty homes are to be built, of which 25 will be constructed in 1956, nine in 1957, eight in 1958, and eight in 1959. All homes will be fully furnished, but will remain unoccupied.

All of the homes, except those in the experimental category, will be designed of materials and equipment that are available to the building industry. Two homes, urban and farm, of 30 years or over, will be moved to the site and modernized. The homes will be redecorated and refurnished yearly. Equipment and appliances will be replaced by new models as they are marketed. Upon completion of the 50 homes, yearly replacement of 10 homes will begin to keep the project abreast of the industry's progress.

A design committee, selected from members of the architectural, interior design and builder professions, will act as a board of selection to formulate the program and to select design teams for each home. The design teams, consisting in each case of an architect, interior designer, landscape architect and builder, will be responsible for the complete design of each home. These teams will be selected from all regions of the country.

Home construction will start in April 1956, and the opening date of the center is scheduled for January 1957.

## Speaks on Future of Metal Curtain Wall

THE GROWTH of the metal curtain wall industry depends on intensive research, new product development, and a concerted effort to develop a friendly and cooperative relationship among competitive manufacturers. These points were brought out by Frederick J. Close, manager of market development for the Aluminum Company of America, in a talk given at a research correlation conference on metal curtain walls held recently by the Building Research Institute in Washington, D. C. "There is no short cut to success in this field," Mr. Close said. "It's research. It's development. It's cooperation." More than 500 architects, engineers, designers, and contractors attended the meeting.

## Faster Payments For Defense Work

THE DEFENSE Department has decided to make progress payments to defense contractors mandatory, and to require uniformity among the services in making such payments. These payments are advances made to contractors based upon incurred costs as work progresses under the terms of a contract. One of the major obstacles to a broadened mobilization base, according to the U. S. Chamber of Commerce, is the reluctance of many small firms to participate in defense contracting because of insufficient operating capital and difficulty in obtaining supplemental financing. The assurance of progress payments to smaller contractors should help eliminate this obstacle, the chamber said.

# Now - Honeywell offers you line of bi-metal

*Creatively styled, precision*

**L498A**
**Combination Control**

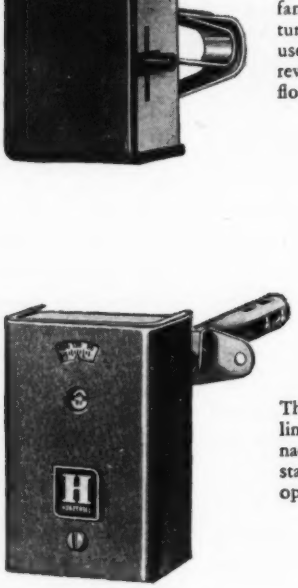
Designed for application with all types of forced warm air furnaces, it closes the fan circuit and opens the limit control circuit on temperature rise. Closes limit circuit and opens fan circuit on temperature drop. Also available with manual fan switch.

**L477A Cutout Switch**

A manually reset safety control device that provides positive fan shutoff when air temperature becomes critical. It is often used to prevent possibility of reverse circulation in counterflow furnaces.

**LA412 Furnacestat***

Prevents fan operation until required bonnet temperature has been reached. A summer setting provides for continuous fan operation.



**LA419 Airstat***

The Airstat is used as a high-limit control for warm air furnaces, nonadjustable differential standard. Adjustable differential optional.

**LA445A**
**Combination Limit and Two-Speed Fan Control**

A Combination Limit and Two-Speed Fan Control to control two-speed fan motors. The fan starts on low speed when the bonnet temperature rises to the indicator setting and switches to high speed when the high-speed setting is reached.

*For complete information on the Honeywell line of Fan-Limit Controls, write Honeywell, Dept. AA-12-172, Minneapolis 8, Minnesota.*

**Trademark*

# the most complete fan-limit controls!

**Featuring the finest "flat-spiral" model made!**

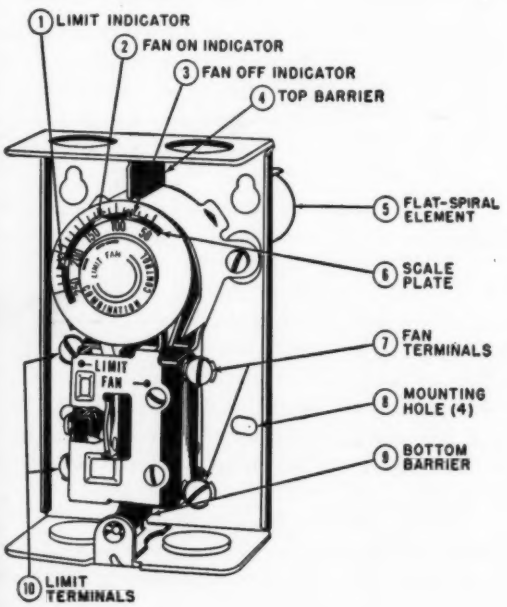
*designed, ruggedly built!*

NOW HONEYWELL has everything you need in high-quality fan-limit controls. The line looks good, is easy to install, functions with precision and gives the dependable kind of service that means fewer trouble calls.

And only the Honeywell Fan-Limit Control line offers you these advantages:

(1) Works for *all* voltages. High-quality electrical contact structure gives sure performance at any voltage. (2) Lets you standardize on a single line. (3) Simplifies your stocking problems. (4) Allows you to mix line-and low-voltage controls. (5) Rugged construction incorporates the finest materials and workmanship. (6) Very latest styling. Wrap around, one-screw cover. (7) More models, more lengths, and more combinations to meet your specific control needs —than any other manufacturer makes. Everything from controls for the simplest gravity system to the most modern forced-air system.

So remember, for precise, trouble-free operation—there is no substitute for quality. That's why in Fan-Limit Controls—there is no substitute for Honeywell.



## *L498C and D Combination Controls*

Actuated by a flat-spiral bimetal element protruding only 1½ inches—these new Honeywell controls are ideally suited to applications where space does not allow an element of conventional length.

The finest controls of this type yet designed—the L498C and D combine high-limit control and operation of the fan motor independently of the thermostat. They may be used in line- and low-voltage circuits, and are applicable to Powerpile* systems. The D model is equipped with a manual fan switch.

MINNEAPOLIS **Honeywell**

H HONEYWELL *First in Controls*

112 OFFICES ACROSS THE NATION

(Continued from page 19)

# Home Modernization Sales Campaign Starts in January

OPERATION Home Improvement has established offices at 10 Rockefeller Plaza, New York 20, from which it will direct a nationwide sales campaign designed to interest more people in improving their homes and to make it easier for people to buy materials and services. A seal has been developed for use by the industry in presenting to the public the idea of 1956 as home improvement year. At the national level, the seal will be used in manufacturers' advertising and in magazine editorial page layouts. At the local level it will be used in all types of local advertising and promotion by dealers, retailers, lenders, builders and contractors.

A sales promotion kit is also being prepared for use at the local level. This will contain mats, window streamers, truck cards, suggested radio and TV commercials, etc. to make it easy for the dealer to tie in with the national program. The kits will be sold at cost through manufacturers and associations, or may be purchased from the group's New York headquarters.

The program will be officially launched on January 16 by HHFA Administrator Albert M. Cole.

## Plan to Revise Minimum Property Requirements

FEDERAL HOUSING Commissioner Norman P. Mason has assigned specialists from both Washington headquarters and field operations to study FHA's minimum property requirements with a view to revision. "Because of their impact on residential construction," Mr. Mason stated, "it is essential that the minimum property requirements keep abreast of current building methods and materials." He said that while the members of the task group will do the actual revising, they will be guided by an industry advisory committee, meeting at intervals to review their work. "The issues at stake in the restudy of the minimum property requirements do not necessarily involve either raising or lowering of the present standards," Mr. Mason stated. "The need is for simplification and standardization in order that FHA property requirements may be put to more effective use in creating better housing standards for all Americans."

## October Construction Sets New Record

SPENDING for new construction declined seasonally in October to $3.9 billion, 11 percent above the previous peak for the month set last year, according to preliminary estimates prepared jointly by the U. S. Departments of Commerce and Labor. On a seasonally adjusted basis, construction activity though October has been at rates which indicate that 1955 expenditures for new construction will total approximately $42 billion — topping last year's record $37.6 billion by more than 10 percent. Actual expenditures for the first 10 months were 13 percent higher in 1955 than in 1954.

## 1955 Volume Index To Be Available

AN INDEX FOR American Artisan's 1955 issues, Vol. 92, Nos. 1-12, is being compiled and will be available soon to the Artisan's subscribers on request. If you want a free copy, send a note or postcard to the Editor, American Artisan, 6 N. Michigan Ave., Chicago 2.

We'll keep your request on file until the index has been printed, and will then mail a copy to you.

## Room Conditioner Sales Reach All Time High

RETAIL movement of room air conditioners reached an all time high of about 1,300,000 units during the 1955 selling year, according to figures released by the Air-Conditioning and Refrigeration Institute. Factory and distributor inventories reported to ARI were down to 206,700 by the end of the summer.

## '54 Census of Business Statistics Available

First statistics from the 1954 Census of Business and the Census of Manufacturers, off the press last month, will bring up to date the statistics on retail, wholesale and service trades last collected in the 1948 census. First to appear are preliminary releases, followed later by state bulletins, subject bulletins, trade reports and final bound volumes, winding up in 1956. For information and to secure copies, write: Public Information Office, Bureau of the Census, Washington 25, D.C.

## *Directory Section to Be In Next Month's Issue*

AMERICAN ARTISAN'S DIRECTORY of Residential Air Conditioning, Warm Air Heating and Sheet Metal Products—completely revised and brought up to date—will appear in the January issue.

Listing sheets have been mailed to thousands of firms throughout the country who manufacture the hundreds of items of equipment used in residential air conditioning, heating and sheet metal work for the latest information on what products will be available during 1956. The information is carefully classified for your use, along with complete street addresses and trade names.

The January issue will of course carry its regular quota of editorial content in addition to the Directory Section.

# VICTOROIL

HEAVY DUTY OIL
HORIZONTAL UNIT

*The* DO-1805 & DO-1965
*for*

## INDUSTRIAL & COMMERCIAL USE

***Large Homes • Service Stations • Public Buildings • Big Jobs!***

***SAVE FLOOR SPACE***
***Install On or Under Floor • In Attics • Utility Rooms • Crawl Space***

Series "D" COUNTER-FLO
For BIG JOBS Usually Requiring
2 Smaller Units. Delivers
160,000 BTUs at Bonnet

**Here's a pair of VICTORS to tie to!** The big space-saving VICTOROIL HORIZONTAL unit delivering 180,000 and 196,000 BTUs is especially designed for small industrial, commercial and large home installation where floor space is at a premium or where attic or crawl space installation is desired.

The *husky* VICTOR series D-200 COUNTER-FLO is designed to complete your line by meeting the increasing demand for ONE powerful Counter-flo BIG enough for today's modern slab or ranch-type homes. They are VICTOR "FIN" constructed and are *WARRANTED FOR 15 YEARS!*

***Mail Coupon TODAY!***

**HALL-NEAL FURNACE CO.** 1322-42 N. CAPITOL AVENUE INDIANAPOLIS 7, IND.

Gentlemen: *Send full details on Series "D" Horizontal Oil* ☐
*Send full details on Series "D" Counter-Flo* ☐

Name_____

Firm_____

City_____ State_____

# Republic can help you tackle any kind of fabricating job

No matter how commonplace or how unusual the requirement, fabricators find Republic Steel Sheets ideal for a wide variety of applications. Here are four of Republic's most popular sheets.

**Galvanized**—with a steel or copper steel base. Particularly suitable for fabricating air conditioning and ventilating systems in any type of building or home. Ideal for many other types of sheet metal work. Highly ductile, easily bent, flanged, or otherwise fabricated. Tight zinc coating assures years of trouble-free service.

**Galvannealed**—with a steel or copper steel base. Will take paint and lacquer without preliminary treatment. The spelter coating adheres tightly to the base metal so that flaking or peeling does not occur. And the dull surface presents an ideal base for paint. Particularly suitable where product is exposed to weather conditions.

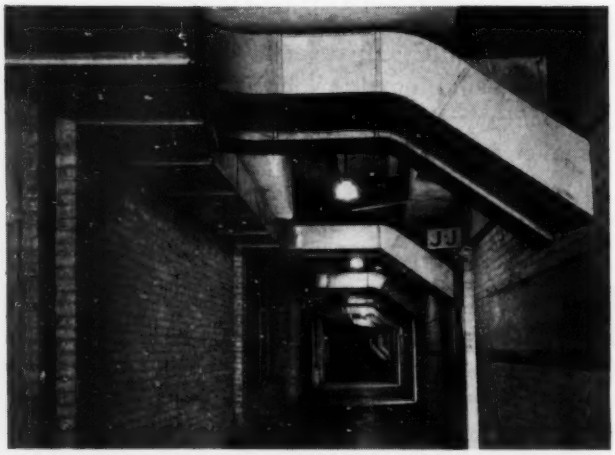
**Electro-Paintlok**—a zinc-plated, chemically-treated steel sheet designed to take paints, lacquers, synthetic enamels—and to hold them for years. Ideal for jobs where a fine, lasting painted surface is desired. No special cleaning is necessary—only the removal of fingermarks and dirt. Will withstand the most severe forming without flaking or peeling.

**ENDURO® Stainless Steel**—Of all commercial metals, only stainless steel offers so many advantages. It resists rust and corrosion. It has attractive appearance. It is easy to clean. It is strong and tough—even resists heat. It can be fabricated on your present equipment. And it offers excellent profit possibilities by enabling you to give the "extras" that mean satisfied customers.

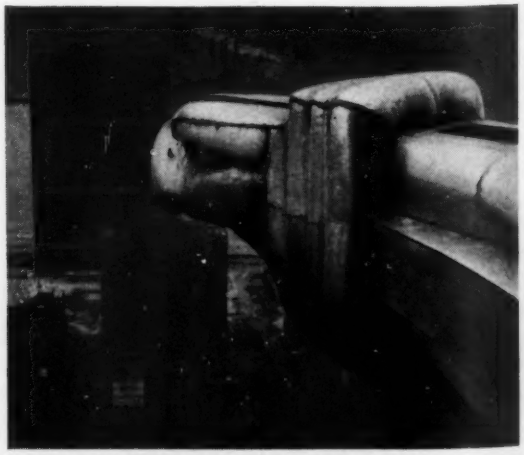
Republic also makes many other sheets including galvanized sheets for roofing and siding, and hot and cold rolled sheets and strip. For fast delivery or additional information, call your nearest Republic Steel Distributor. He'll be glad to help you.

## REPUBLIC STEEL

*World's Widest Range of Standard Steels and Steel Products*



**GALVANIZED SHEETS**—have many applications. For added rust-resistance, use Galvanized with a copper steel base, shown here installed in the main trunk line and exhaust ducts of a ventilating system.



**ENDURO STAINLESS SHEETS**—provide exceptional resistance to corrosion. Require little maintenance. This unusual application, one of eight gargoyles installed in 1930 on the Chrysler Building, is 25 years old. They still are as good as new—with no corrosion in sight.

**FOR JUST THE RIGHT FINISHING TOUCH** on any institution or private dwelling, install roof drainage products made from ENDURO Stainless Steel. Fabricated by Republic's Berger Division, the "K" gutters, being installed here, are made of Type 301, 28-gage stainless steel. Under normal conditions they'll last the lifetime of the building. And maintenance is negligible. Send coupon for more facts.

REPUBLIC STEEL

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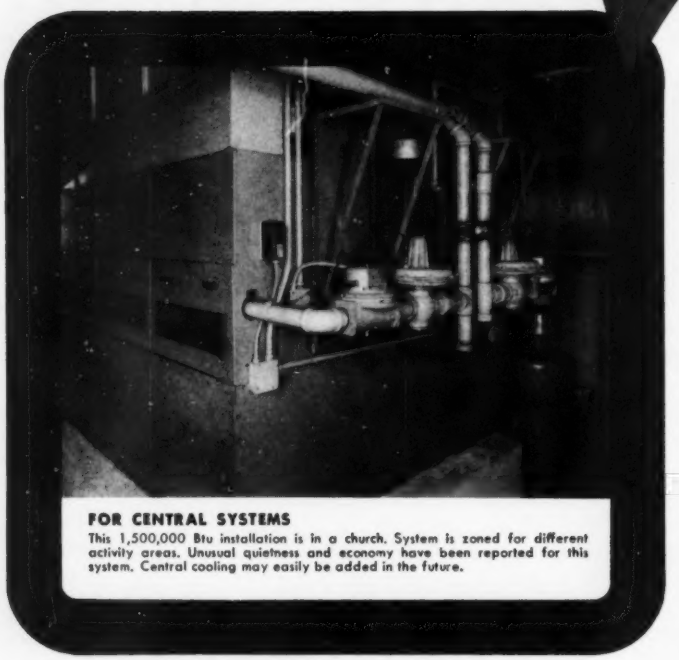
Get all the facts on Janitrol's exclusive Series BDC Blower Heaters and be ready to go after your share of the big jobs. Write today for complete specifications.



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## Washington Letter

# Revision of FHA Property Codes Upgrades Minimum Requirements

**By Arnold Kruckman**

**Proposed standardization of minimum property requirements would affect heat loss calculations, floor slab insulation, unpainted sheet metal flashing and roofing, gutters and downspouts**

BUSINESS PROSPECTS for the building industry — especially housing — were made clearer late in October by FHA Commissioner Norman P. Mason. "We were accused of dragging our feet," stated Commissioner Mason, "but the delay resulted because the builders were not satisfied with our rules and regulations which were brought out about three weeks after the law was passed by Congress."

Mr. Mason was frank in declaring that the blasts came from Congress as well as from industry. And he met the criticism that the government had made no move to lift its credit restrictions in the housing field by asserting his belief they would be eased or lifted entirely if it is proved they have resulted in a marked reduction in housing volume.

FHA made a nationwide housing vacancy survey. It found just over 2 percent of America's housing is empty. It figures a 7 percent vacancy is safe for earning 6.5 percent on invested capital in rental projects.

The vacancy survey was conducted by the post office department for FHA. Postal employees made house-to-house canvasses on their routes. These figures gave the best picture of true vacancies the agency could obtain. The commissioner stated all postal and census department vacancy surveys show a strong sustained demand for housing.

### Standardization Is the Goal

The commissioner said the simplification and standardization of FHA's minimum property requirements are under way. He declared there would probably be major revisions, but that simplification is the main goal. Present minimum property requirements are published in 28 separate booklets to cover regional variations in building needs, equipment, supplies and practices throughout the country. Commissioner Mason says these booklets have had a tremendous effect on home building standards in America during the past 21 years, and that they should be clarified and standardized in a single publication.

The revisions will be submitted by a group of specialists from Washington headquarters and from the field. The task group of 15 FHA staff personnel headed by William J. O'Connor will be guided by the Architectural Standards Advisory Committee.

The commissioner regards upgrading of insulation requirements as the most far-reaching of the proposed new changes. It involves reduction from 60 to 55 Btu per sq ft of floor area in calculated hourly heat loss, the establishment of maximum heat loss coefficients for walls, ceilings and floors, new requirements for perimeter insulation of floor slabs on ground, a limitation on loose fill insulation and other changes.

Other relaxations to be submitted in minimum property requirements include the following:

1) Painting of unexposed portions of galvanized sheet metal used as flashing or roofing would no longer be required.

2) Installation of gutters and downspouts would be required only if soil and other conditions make them necessary.

### Restore Long Terms?

Commissioner Mason, in the Washington meeting, would not specify the point at which the credit faucet would be reopened, but said that if new construction falls below 1,250,000 to 1,300,000 a year "we'll be underbuilding," and the first move probably will be to restore the 30 year payment term rather than reduce down payments on FHA-insured homes.

He said housing starts jumped 7 percent in August despite the curbs,

# WASHINGTON LETTER–

(Continued from page 27)

because home buyers feared still heavier government curbs. In September, starts fell off 8 percent.

The Treasury, the Federal Reserve Bank Board, and the Securities Exchange Commission and similar agencies naturally were leading the effort to maintain credit curbs of various kinds. Some people in Washington commented that the banks, the mortgage organizations and other loan institutions naturally took leadership from these agencies of the federal government.

Apparently the national real estate organizations, builders groups, material producers and equipment manufacturers, dealers and contractors have determined they would not accept the restrictions without strong opposition in this period of extraordinary prosperity.

### NAHB Airs Complaints

The National Association of Home Builders voiced its discontent with the restrictions imposed by the financial agencies. The drive for clarification of the differences of opinion in the economics involved came to a climax at the meeting of the National Association of Real Estate Boards, in New York, early in November, in which both sides participated. Every important agency of the federal government sent an outstanding representative. Probably the most remarkable address, for its startling frankness, was made by a former FHA administrator, now housing economist for the Mortgage Bankers Association of America in Washington, D. C., Miles L. Colean. He began his address thus: "The mortgage market is said to be in trouble. Bank loans for carrying a mortgage account are hard — some would say impossible — to get. Mortgage companies, caught with loans for which no permanent financing has been arranged, are having to pay painful discounts to portfolio lenders. Some savings institutions have had to sell mortgages in order to get funds to meet commitments. Down payments and maturities being asked by lenders are much tougher than required by the regulations. Construction money is scarce. Advance commitments for next year's building are as scare as trees on Park Avenue. Uncertainty clouds the future and builders are filled with apprehension." He developed the idea of the past year of prosperity, and gave a candid analysis of the manner in which the present conditions have developed. He was cautiously optimistic about the year ahead. "The question is," he said, "will the time be brought close enough for builders to form their plans for 1956 to prevent a serious down turn in house building next year? The question is certainly a debatable one; and I do not doubt that it is being gravely debated in high places. The policy decisions made this month and next will be crucial. If it is concluded that the general health of the economy demands further astringent treatment, the shrinkage is more likely to occur in house building than in other kinds of construction, or in other areas of the economy, which either are not so dependent on credit or are more readily able to pay a high price for money."

"The tipoff may come from what the Federal Reserve Banks do or do not do about their discount rates within the next few weeks. A raise in the reserve discount rate would certainly suggest that the period of restriction was to be further prolonged. It begins to look as if the rate would not be raised.

### Sees Increased Savings

"The large increases in disposable income during 1955, the prospect of further wage increases in 1956, and the virtual certainty of a cut next year in the federal personal income tax, should result in the accumulation of savings in considerably larger volume next year than this year. More families should have funds for higher down payments and higher monthly charges than appeared to be the case early in 1955, when house building was riding the easy money wave.

### Credit Still Tight

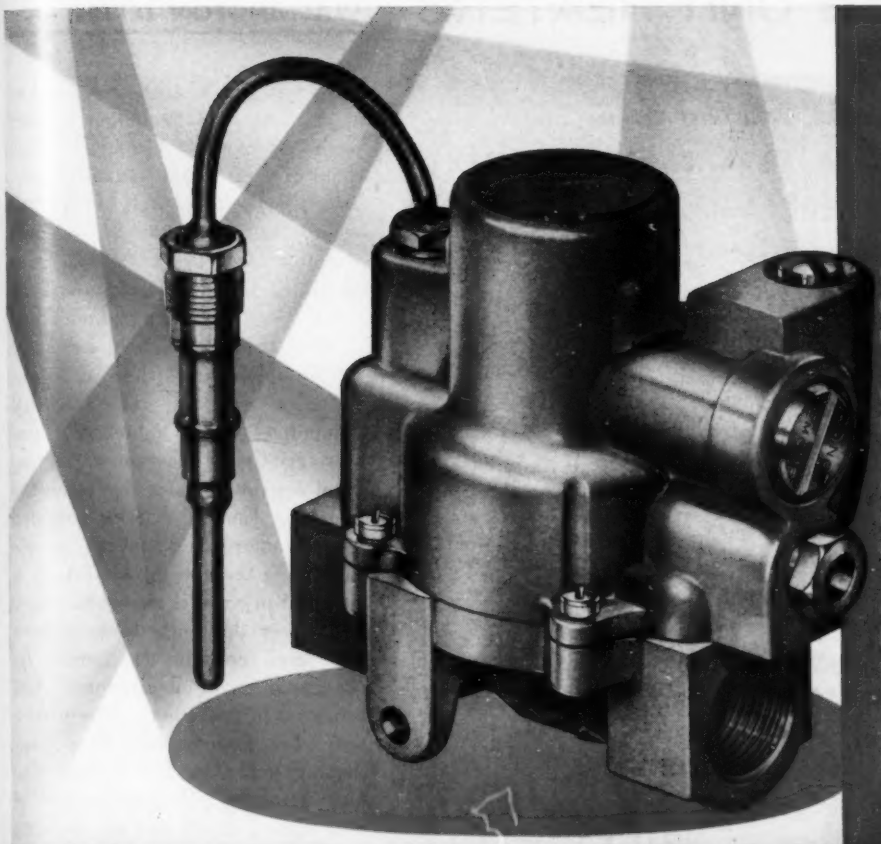
"Nevertheless, it cannot be contemplated that 1956 will start off with quite the buoyancy of the early months of 1955, any more than it can be expected that credit in early 1956 will be as loose as it was in early 1955. By comparison, credit will still be tight. . .Next year is certain to be another good year for both builders and mortgage men; and it follows that it will be a good year for others in the business. House building may not reach the same level it will come to in 1955; but neither is it likely to fall much short of this very satisfactory performance."

Other speakers reported over a million dwellings were started in the first nine months of this year. Population is growing at the rate of 200,000 a month. Half of all nonfarm families have lived in their present homes less than five years.

The mayor's committee of New York reported New York City's greatest housing need is for middle income families; that a large gap exists between the rentals for public housing and rent controlled housing on the one hand, and rentals required for unsubsidized new housing on the other. The New York committee believes the need for middle income housing can be supplied only by private enterprise.

### Production Is At Peak

HHFA Administrator Albert M. Cole suggested that the 6000 savings and loan associations of the U. S. Savings and Loan League comprise the greatest single source of capital for the American home. He reiterated



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**Lightweight cuts shipping, installation costs**

WEIGHT COMPARISON

| Brand | Capacity (Btu/hr. input) | Approx. Net Weight |
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| Modine (aluminized steel) | 105,000 | 105 |
| Modine (stainless steel) | 105,000 | 95 |
| Brand "A" | 100,000 | 170 |
| Brand "B" | 102,000 | 196 |
| Brand "C" | 90,000 | 175 |
| Brand "D" | 100,000 | 165 |
| Brand "E" | 100,000 | 210 |
| Brand "F" | 100,000 | 210 |
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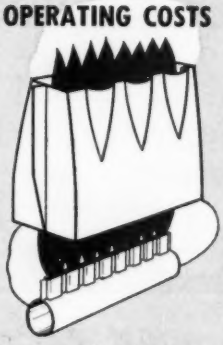

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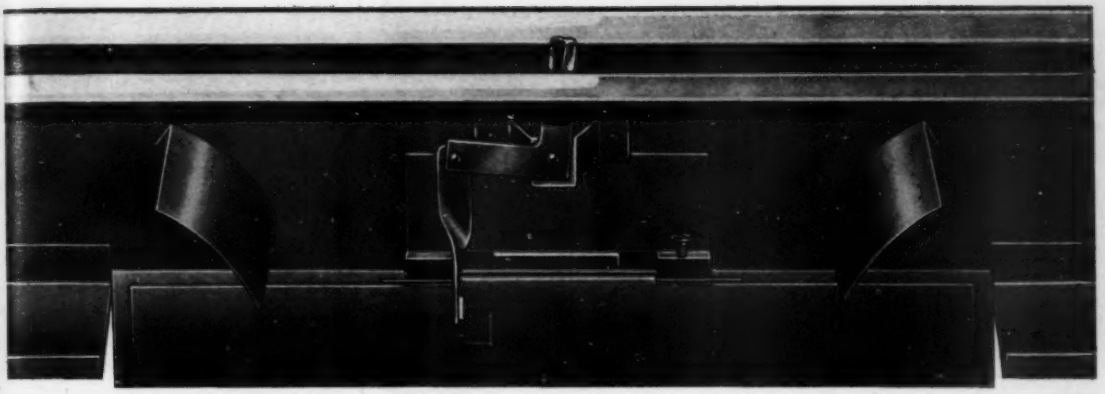
## WASHINGTON LETTER —

our production of goods and services at the rate of $400 billion a year, the highest in our history, is three times as great as the annual production of Soviet Russia. He is confident we will continue building new homes at a rate of about 1,200,000 a year, or a little higher. He said urban renewal operations are now under way in more than 200 communities.

The address of Arthur W. Viner, executive secretary, The National Committee of the Voluntary Home Mortgage Credit Program, stirred unusual interest. This is the voluntary mortgage lending activity initiated by the mortgage banking people themselves through the HHFA. It is designed to channel money to people and places that hitherto have been considered entirely too remote by circumstances to obtain loans. The program, in operation a little over a year, has placed over 7000 loans totaling well over $50 million. The loans are being placed at the rate of over 1500 a month and are growing in number each month. Mr. Viner pointed out in many cities the great need is for housing available to Negroes, and that there are many qualified Negro borrowers. He reported many operators are using the services of local bankers, real estate brokers and attorneys to handle the applications. Some use lumber dealers, small volume builders, contractors, equipment retailers — many of whom never before have had business relations with mortgage bankers.

### Analyze Building Market

E. Everett Ashley III, chief, Reports and Statistics Section, Housing and Home Finance Agency, in an analysis of what makes market conditions, gave this definition of the main points to investigate in order to analyze the building market for housing, shops, stores, plants, or any other kind of shelter, either locally or nationally: "1) unsold new dwellings; 2) employment and income; 3) population trend; 4) migration and mobility; 5) volume of new



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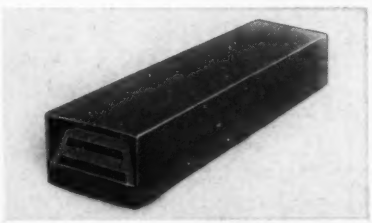
Here is the most advanced new perimeter diffuser model. Built to such precision standards, it is *years ahead in design, appearance, performance.* It is truly the most efficient diffuser ever built ... handling cool or warm air with equal efficiency ... keeping uniform temperatures throughout the room ... directing the air where it is most needed ... eliminating low level stratification.



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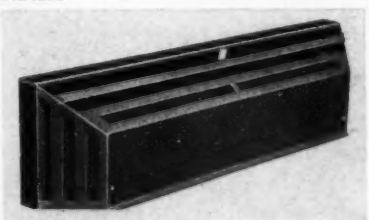
Each Titus perimeter diffuser is individually packaged to assure *perfect condition* and *perfect protection of finish* in traveling from factory to installation.



**• *NEW COLOR STYLING AT NO EXTRA COST***

New hammertone finish brings an *impact of distinctive modern design to any room.* Creates new character for the whole structure of a room. Is the most beautiful finish ever created for perimeter diffusers.

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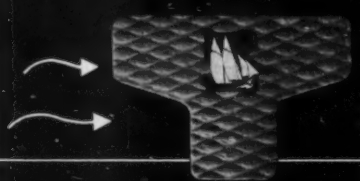

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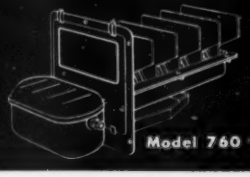
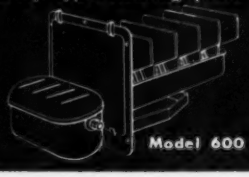


Model 760



Model 600 B

## WASHINGTON LETTER —

building; 6) source of financing.

"Some 78 million people, or nearly half the population, changed their residence between April 1947 and April 1951. In one year roughly 21 million people moved from one address to another in the same county. In many important American cities one-sixth or more of the people lived in different houses at the time of the census than they had a year earlier. In 168 standard metropolitan areas the populations of the central cities increased only 14 percent whereas in the surrounding areas they increased by 35 percent.

### Watch Replacement Market

"This restless movement of people in and around our important population centers plays a major role in creating the market demand for housing, old and new. In the main, the people making these intra-area moves neither need nor want new housing. Most of them shift from one to another of the dwellings in the vast existing stock of housing. They open up the possibility for a replacement market which the home building industry must cultivate if it is to make the most of its opportunity.

"HHFA has developed a number of guides which should be helpful. There is, for example a manual, How to Make and Use Local Housing Surveys, which explains in laymen's terms how to determine the number of vacancies or characteristics of occupied dwellings. Another publication, How to Make and Interpret Locational Studies in the Housing Market, shows how to identify the fastest growing suburbs around a central city. A technique for measuring activity in the housing market is found in Housing Market Analysis: A Study of Theory and Methods. An approach to measuring consumer preferences in the housing market is set forth in What People Want in the Houses They Buy. Those interested in such data will do well to have copies of these reports in their libraries."

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"For the past six years I have been dealing with various manufacturers and suppliers and I can truthfully say that I have never had such co-operation and genuine desire to give the very best of service as I have enjoyed from your company personnel."

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# Lead Awards Build Prospect Lists

ONE METHOD of locating prospects for heating systems is being used to good advantage by the Aire-Flow Heating Co., Yakima, Wash. Realizing that satisfied customers are excellent recommendations and that a constant reminder of where you can be reached will mean more business to you, R. A. Dittmar, owner, enlists his customers in locating new prospects for his services. He uses a mailing piece addressed to new customers telling them how they can earn a valuable present for their new home.

CUSTOMERS WHO HAVE been responsible for developing the sale of a warm air heating system are rewarded for their assistance with a present which they may choose from a large selection of nationally known products

### Folder Describes Gifts

The satisfied customer is asked to fill in a self-addressed postcard with names of three people he believes will be prospects for heating systems. The card is attached to a descriptive folder that describes the presents he may choose if any one of the prospects buys a heating system. If more than one prospect buys a heating system the person sending the names to the company may choose two presents from the folder or come to the company's office and select a present from a larger catalog containing a wider selection of gifts of twice the value awarded for one prospect who has become a customer.

There have been a number of customers who talked up the reputation of the company among their friends to the extent that one lady has been responsible for the sale of seven heating systems. Another customer has sent in the names of five prospects, all of whom have purchased heating systems.

### System Has Two Functions

The value of having high quality and useful presents from which the customer may make his selection serves two purposes: 1) It keeps the source of the present fresh in mind; 2) it serves as a reminder that other presents may also be obtained by being alert to the needs of his friends and neighbors.

The brightly colored folder describing the presents is 14 × 24 in. and displays 24 items such as electric percolators, cameras, picnic kits, velocipedes, briefcases, cooking utensils, clothing, jewelry, toys, fans, electric irons, a portable electric saw, a set of blankets and a handbag. Each item is well described and a number of well known brands are mentioned.

The company's name and address is prominently displayed in several places. This is to take further advantage of the folder as a merchandising and sales promotion tool.

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...with most compact, most flexible AIRTEMP "Spacesaver" System!

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And here's another "Spacesaver" feature you will like! Where you can sell only heating at the outset, decal attached to empty coil housing continues to remind customer that "This is the place for future installation of an Airtemp Cooling Coil". And your identification tells him where to phone when he's ready.

It will pay you to have all of the facts on the franchise that offers you a brighter future in heating *and* cooling. Write Department AA-12, Airtemp Division, Chrysler Corporation, Dayton 1, Ohio.

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National Association HOME BUILDERS Convention Exposition January 22-26 1956

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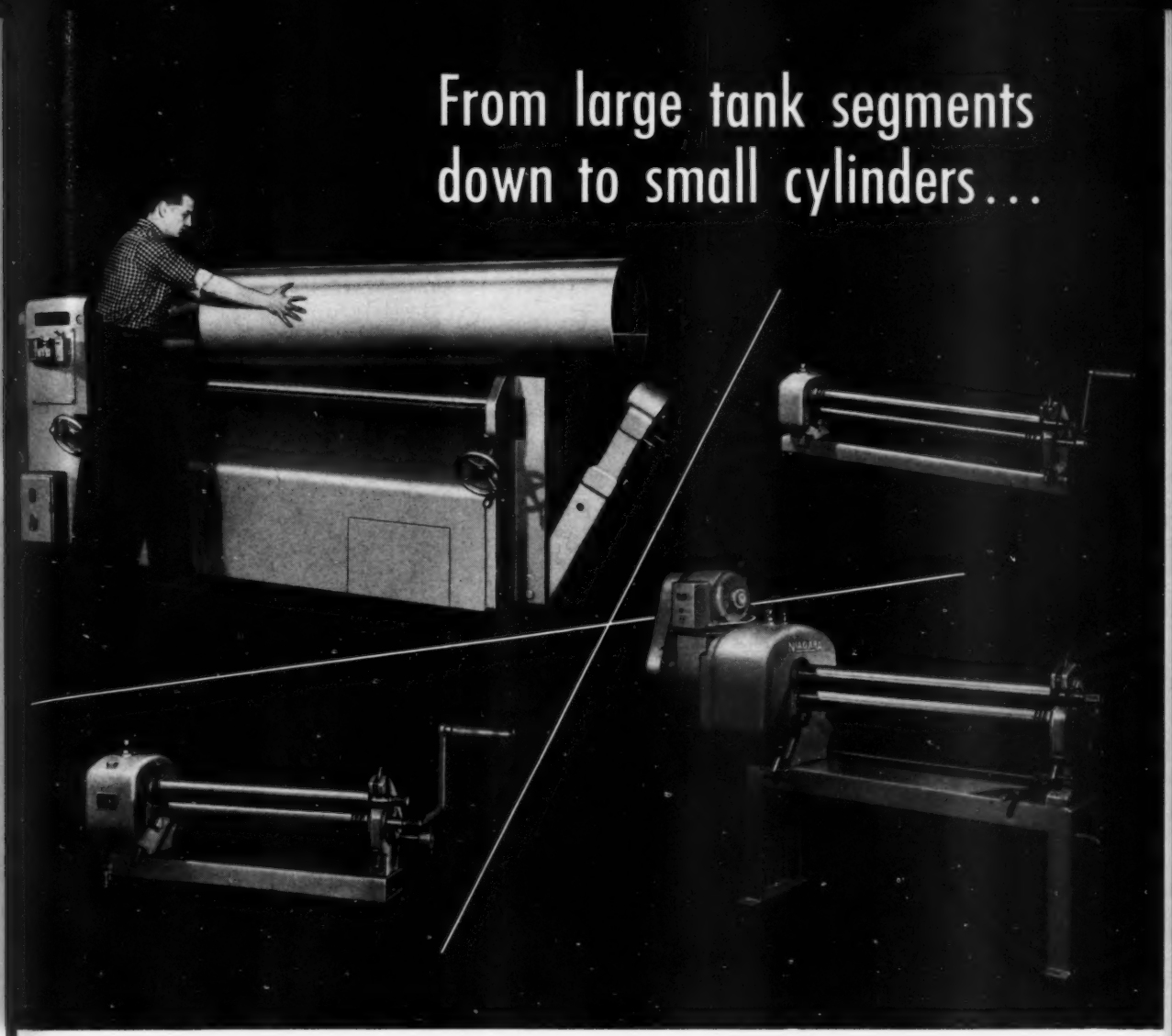


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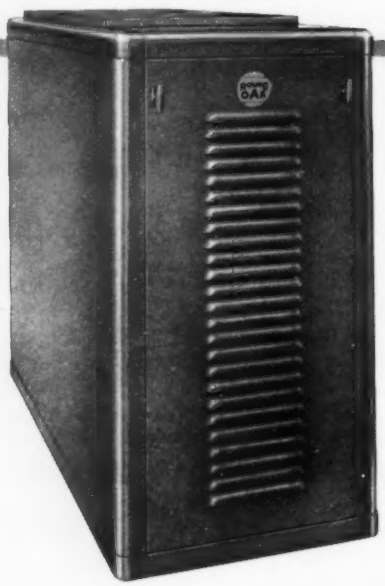


# ROUND OAK
## HEATING

Round Oak has been a famous name in heating since 1871. Highest quality has made that history possible . . . it's the kind of quality that sells customers Round Oak heating equipment, the kind that makes a customer your friend for life. Built with only one thought in mind—to be the best. The beautiful new Round Oak line is ready now, in either gas or oil firing.

Round Oak helps you sell, too . . .

ROUND OAK CO., INC., Dowagiac, Michigan AA

Rush me full details on Round Oak heating and air conditioning.

Name.....

Company.....

Address.....

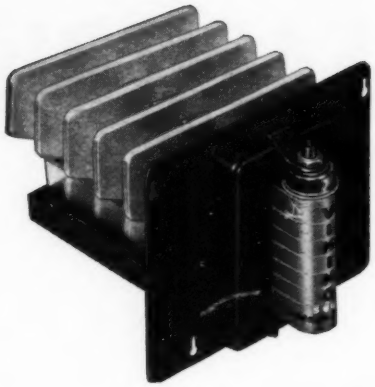
City.....State.....

**LIKE 58 SALES HANDS**

. . . it's the new Round Oak Sales Presentation. This 58-page self-seller will make anyone a salesman . . . make any salesman a star salesman!

Its plastic-coated pages sell the full Round Oak line . . . heating, oil and gas and the great air conditioning line.

Every Sales Presentation is like another salesman on the staff.



## "5600" AquaMagic Humidifiers by Viking

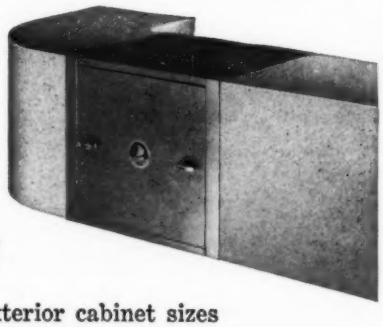
World's only humidifier with a leak-proof ovenware glass pan. Holds up to 10 evaporator plates although 5 fill most home humidifier needs.

## Blower Packages by Viking

Five models — two with round and three with square cabinets.
Five capacities for from 75,000 to 230,000 BTU/HR furnaces.

## Blower Assemblies by Viking

Belt Drive and Direct Drive Blowers in a wide range of sizes and capacities. Available with permanently mounted feet or new "Lock-on" feet for factory installation in new furnaces or as replacement blowers for dealer servicing.



## Duct Blower Packages by Viking

Two exterior cabinet sizes and six blower capacities from 600 to 3400 CFM available. You can mount them in any position for air movement through heating, ventilating or cooling ducts.

Order From Your Nearest Viking Wholesaler or Write For Details

**Viking**

**AIR CONDITIONING**

Division of The National-U.S. Radiator Corporation

5601 Walworth Avenue • Cleveland 2, Ohio

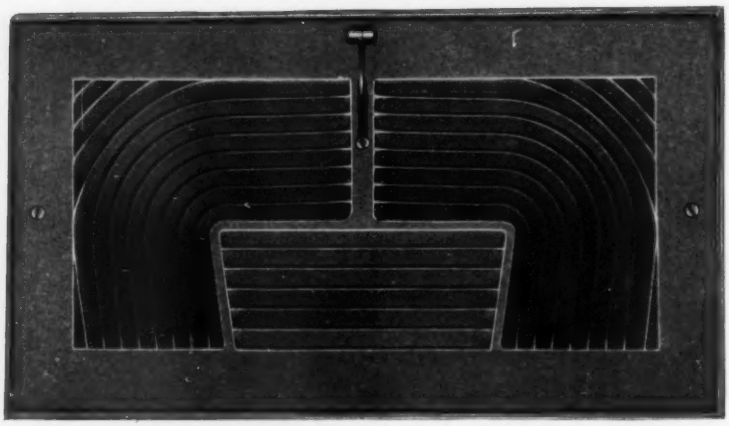
# That GREAT TRIO

## 10" x 6" — 12" x 6" — 14" x 6"

**No. 105 DIFFUSER SIDEWALL REGISTERS**
**No. 106 DIFFUSER BASE REGISTERS**

## *READY FOR DELIVERY!*

## Include These Great Numbers in Your 1956 Requirements



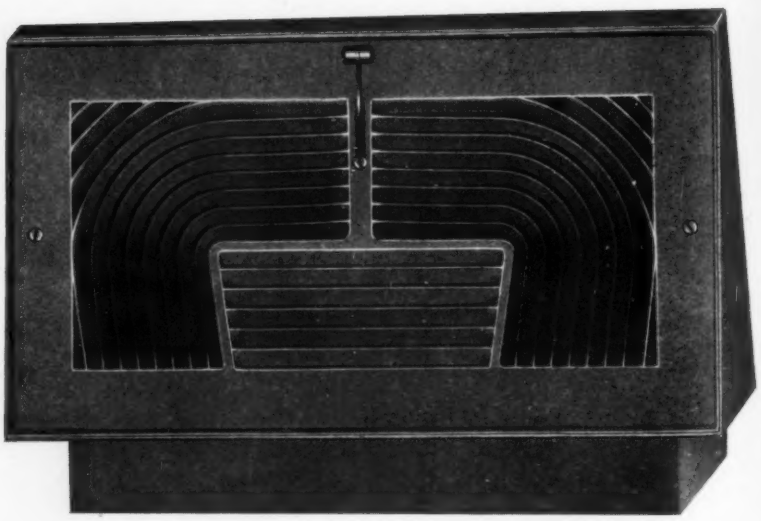
No. 105 U.S. SIDEWALL DIFFUSER — Single Valve with Set-Lock

### LATEST and FINEST
### The GREAT No. 105
**MINIMUM RESISTANCE**

Complete 180° Diffusion — A SUNBURST Pattern of Air Flow that is Even and Constant at every Degree of the 180° Diffusion Range.

### The GREAT No. 106 for BASE PERIMETER SYSTEMS Out-of-Wall Installation
**MINIMUM RESISTANCE**

Complete 180° Diffusion — A SUNBURST Pattern of Air Flow that is Even and Constant at every Degree of the 180° Diffusion Range.



No. 106 U.S. BASE DIFFUSER — Single Valve with Set-Lock

*SEND FOR NEW NO. 55-6 CATALOG*

**UNITED STATES REGISTER COMPANY**

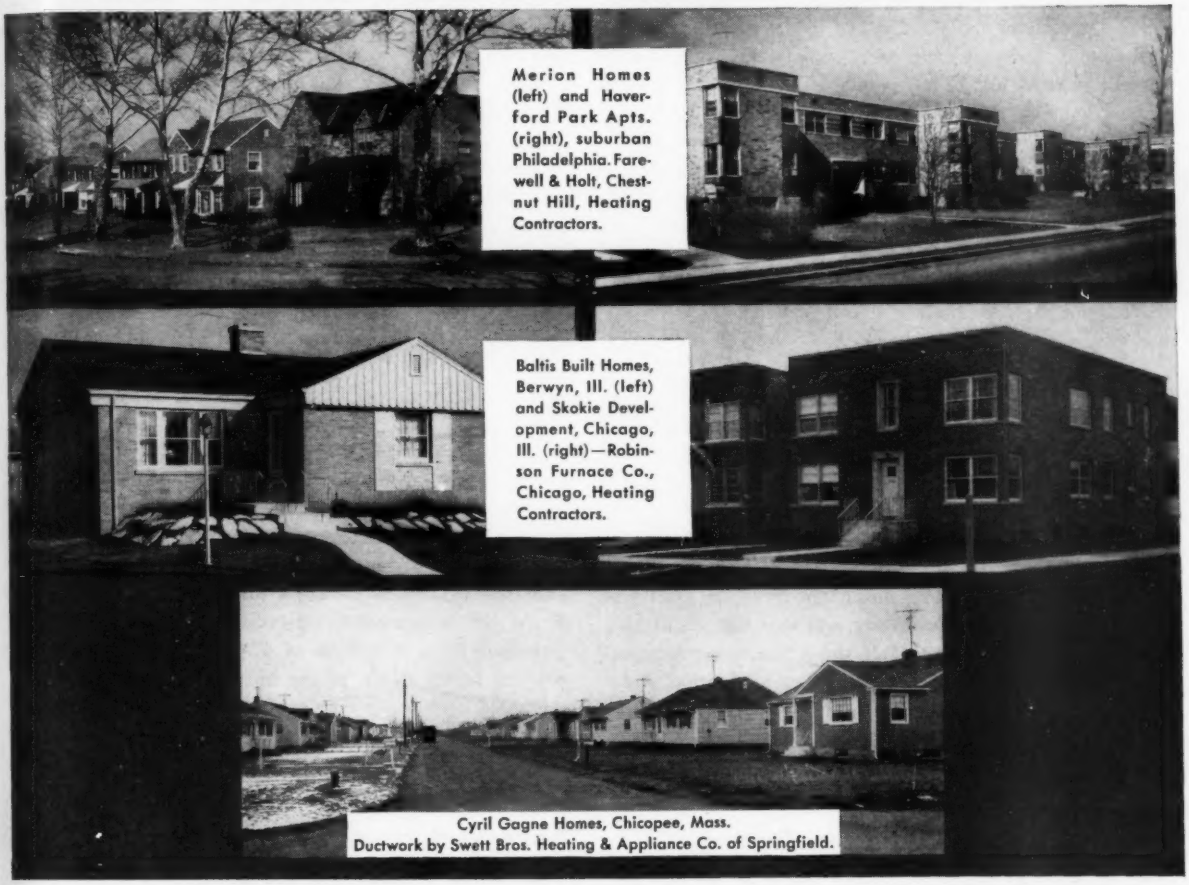
BATTLE CREEK, MICHIGAN

MINNEAPOLIS • KANSAS CITY • ALBANY

SOLD BY LEADING JOBBERS FROM COAST TO COAST

# For All Kinds of Homes, the Trend is to Rustproof Ducts of

# REYNOLDS ALUMINUM



Merion Homes (left) and Haverford Park Apts. (right), suburban Philadelphia. Farewell & Holt, Chestnut Hill, Heating Contractors.

Baltis Built Homes, Berwyn, Ill. (left) and Skokie Development, Chicago, Ill. (right)—Robinson Furnace Co., Chicago, Heating Contractors.

Cyril Gagne Homes, Chicopee, Mass.
Ductwork by Swett Bros. Heating & Appliance Co. of Springfield.

## ...Engineered for Year-Round Air Conditioning!

Low-cost homes, higher-priced homes, residential apartments...in every kind of modern home, wise builders provide for future air conditioning and the heating contractor puts in rustproof ductwork of Reynolds Aluminum. You know that air conditioning means inevitable moisture condensation and the danger of rust damage. You can avoid future trouble and help the builder develop a real *selling feature* in rustproof aluminum ducts.

Reynolds is promoting this selling feature intensively in national consumer magazines and on network TV. Take advantage of this promotion. Make each job more important, as the basis for *future air conditioning.* And identify your ducts as aluminum...Reynolds Aluminum.

Write for detailed information about these "Designed in Reynolds Aluminum" seals.
**Reynolds Metals Company,**
Box 1800, Louisville 1, Ky.

Designed in REYNOLDS ALUMINUM

# REYNOLDS ALUMINUM

See "FRONTIER," Reynolds great dramatic series, Sundays, NBC-TV Network.

# WHAT THE ASSOCIATIONS ARE DOING

## Urges More Dealer Training Programs

N. J. BIDDLE, secretary of the Michigan Heating & Sheet Metal Association, reports that the theme of the group's 45th annual convention will be "By our work, your products are known." Mr. Biddle points out that the contractor is the key man in the chain of distribution, the one who selects all of the products to be used in the job except for an occasional choice by the customer as to the heating unit. "The rest of the industry is entirely dependent upon the contractor for the proper installation and consequent operation of the products in the field," Mr. Biddle says. "A good contractor can take a mediocre product and make it work while a poor contractor can make the best product perform like an inferior one."

According to Mr. Biddle, when good products fail to operate properly on the job, the consumer tends to blame the manufacturer, although, he says, "the actual cause of poor performance is generally faulty installation. That is why we hope to get our manufacturers to realize that if they want to have their products give greater satisfaction, they must help the contractor to do a better job. This does not mean that there are not a lot of contractors doing top work, but it does mean that there are a lot of contractors who do inferior work and it is the job of all branches of the industry to help these fringe contractors to become better business men, better competition and better representatives of the industry."

W. H. Young of the Behler Young Co. has been appointed chairman of the convention committee.

## Wilder Speaks at Rochester Meeting

THE NOVEMBER meeting of the Master Sheet Metal, Furnace and Roofers' Association (Rochester, N. Y.) was held at the Pittsford Inn. Speaker of the evening was Joseph D. Wilder, executive secretary of the Sheet Metal Contractors' National Association, who discussed conditions and developments in the sheet metal industry in various sections of the country.

Secretary Richard W. Friday reminds the members that dues are payable now, and that early-bird remitters will save $20 by paying before January 1, 1956.

## OHI to Hold Show in New York City

GEORGE E. HOCHSTEIN, president, Oil-Heat Institute of America, has signed a lease with the new Coliseum in New York City. The lease provides the institute with over 70,000 sq ft of floor space for its exposition and annual convention to be held June 11 to 15, 1956. OHI expects to have between 450 and 500 exhibitors and an attendance of upwards of 15,000 industry people including manufacturers, wholesalers, dealers and fuel oil suppliers.

## California Group Elects Officers

THE SHEET METAL Contractors Association of Southern California, Inc. recently elected a new slate of officers for the year 1956. The new officers are: president, LeRoy Frandsen, Walter Steyer Co.; vice president, Rudy Evans, Alhambra Sheet Metal; and secretary-treasurer, Alvin Schlom, Schlom & Sons. Bill Van Loenen reported on the joint management-union apprenticeship program, explaining that there are now 803 active apprentices under the program. Prior to March 1955, according to Mr. Van Loenen, there were only 437 apprentices.

## Discusses Unemployment Benefits

THE OHIO SHEET METAL Contractors' Association reminds its members that the bill to boost unemployment compensation will soon be up for vote. It points out in a recent issue of the association News that the A F of L and C I O sponsor a 50 percent raise. The News also points out that "the unemployment compensation fund is created by contributions of the employers of the state, and those contributions are a direct levy on them alone. If the bill is approved, the tax on the employer will be increased by a minimum of 47½ million dollars." According to the News, if the bill is passed the resultant increased costs to the employer must eventually be passed on to the consumer in the form of increased prices for equipment and services.

## Georgia Host to Governing Boards

THE GOVERNING BOARDS of the Roofing and Sheet Metal Contractors' associations of Florida, Georgia and the two Carolinas held their fourth annual meeting at the General Oglethorpe hotel, near Savannah, Ga. Also in attendance was the governing board of the Alabama Roofing and Sheet Metal Contractors Association.

Speakers included Paul Stromberg, president of the Sheet Metal Contractors' National Association, and Steve Raymond, a director of SMCNA. Mr. Stromberg discussed the problem of jurisdictional disputes, pointing out that "your national association is presently represented in conferences which we hope will eventually result in a satisfactory disposition of this problem, and you can be sure that those of you that are members of SMCNA will be kept fully informed of developments." He urged that all contractors in the industry associate themselves with the national association because "it is only through numbers in membership that we can best serve your interests."

Mr. Raymond spoke on the work being done by SMCNA in developing guides for the trade known as

**NOT THIS!** *Many heating systems make people too cold one minute, too hot the next. They have to fuss continuously with the thermostat to get even near-constant comfort.*

**BUT THIS!** *Waterbury* COMFORTROL *By-Pass Heating always gives constant comfort. Simply set the thermostat and forget it. There is no "up-and-down" temperature variation.*

# New kind of heating gives constant comfort ...without fussing with the thermostat!

Things like fussing or not fussing with a thermostat can make the difference between happy or unhappy customers. That's one reason why you'll be ahead if you install new, effortless Waterbury COMFORTROL By-Pass Heating.

Once your customers set the thermostat, they can forget it. They'll get a continuous supply of fresh, clean, humidified air at just right temperature. They'll have *constant* comfort. There won't even be any hot and cold cycles or drafts. Tests show, too, that temperature varies less than one degree between floor and ceiling. And Waterbury COMFORTROL—not the home owner—does the work.

It mixes cool air with warm air in a ratio that provides the exact temperature called for by indoor-outdoor thermostats. It supplies this warmth continuously at the same rate it escapes through walls and windows.

For a sales story that will weaken even a stubborn prospect, plus some good recommendations after you've sold him, investigate Waterbury COMFORTROL By-Pass Heating.

**SEND FOR FREE 32-PAGE BOOKLET!**

"It Takes More Than Heat To Be Comfortable". It's packed with interesting information that will help you sell more units. Write Waterman-Waterbury Company, 1122 N.E. Jackson Street, Minneapolis 13, Minnesota.

Waterbury helps you SELL!

**Waterbury Comfortrol** BY-PASS HEATING

*By the makers of world-famous Waterbury furnaces and air conditioners*

Proposed Codes of Trade Practices of Sheet Metal Work. He explained that copies of the proposed codes have been furnished to many local and state sheet metal organizations who in turn have bound the mimeographed sheets for distribution to architects and engineers in their respective areas. Mr. Raymond pointed out that "SMCNA does not rest on past laurels in this respect, but will continually work on other pertinent subjects to be handled in like manner — which illustrates one good reason why dealers should support a strong national association."

Other speakers included Martin V. Coffey, director of merchandising, Philip Carey Mfg. Co., who gave a talk entitled Selling in the Atomic Age; K. F. Dunlap, a director of the National Roofing Contractors Association, who discussed the research program being carried on by NRCA; and C. N. Nichols of the National Home Improvement Contractors' Association, who outlined plans now being made for promoting business in 1957 in the reroofing, residing, and general home improvement field.

## Kalamazoo Dealers Study Diffusion

FEATURE of the November meeting of the Kalamazoo Sheet Metal, Roofing, Heating & Air Conditioning Contractors' Association was a sound film entitled *The Case of the Diffused Dealer*. The film, produced by the Lima Register Co., explains the principles of proper air diffusion. Many of the members brought their sales and service men to see the picture, which cleared up some of the problems they had been encountering in their work.

The copies of the proposed heating and air conditioning code for Kalamazoo and surrounding areas, which had been loaned to all members for study and comment, were returned by the dealers at this meeting, together with written criticisms and suggestions for the committee.

## Indiana Appoints Nominating Committee

R. A. HARRIS, president of the Sheet Metal and Warm Air Heating Contractors' Association of Indiana, has appointed a nominating committee to select and recommend nominees to fill association offices for the coming year. Members named to serve on the committee are T. B. Speaker, J. W. Ridgway and Harold D. Boyd. All association members are urged to make their recommendations to the committee prior to the directors' meeting which will be held February 2.

A recent bulletin sent by the association to its membership asks, "Do you employ from four to eight persons in the operation of your business?" If so, it points out, "you are going to be vitally affected by a change in the Indiana unemployment compensation law which will become effective on January 1, 1956.

"As of that date, you will be regularly required to file employment and payroll data with the Indiana Employment Security division. At that time, you will become liable for a payroll tax on each of your employees. The tax rate which will be assessed against you will vary in years to come with the degree of stabilization of employment which you are able to maintain. It is up to you to acquaint yourself with eligibility requirements for workers as well as disqualification regulations to protect the reserve account being established by your company."

## Ventilation Conference to be Held

THE FIFTH Annual Industrial Ventilation Conference, sponsored by the School of Engineering, Michigan State University and the Michigan Department of Health in cooperation with manufacturers and contractors in the industrial ventilation field, is scheduled to be held February 6 to 9 at Kellogg Center, Michigan State University. The program will be of the workshop type, featuring informal talks on hoods, duct systems and fans, together with actual classroom problems which call upon the participant to design exhaust systems. In addition there will be talks dealing with the application of dust collection equipment and the problem of supplying makeup air to the building. There will be a choice of three design problems.

## GAMA Elects Division Chairmen

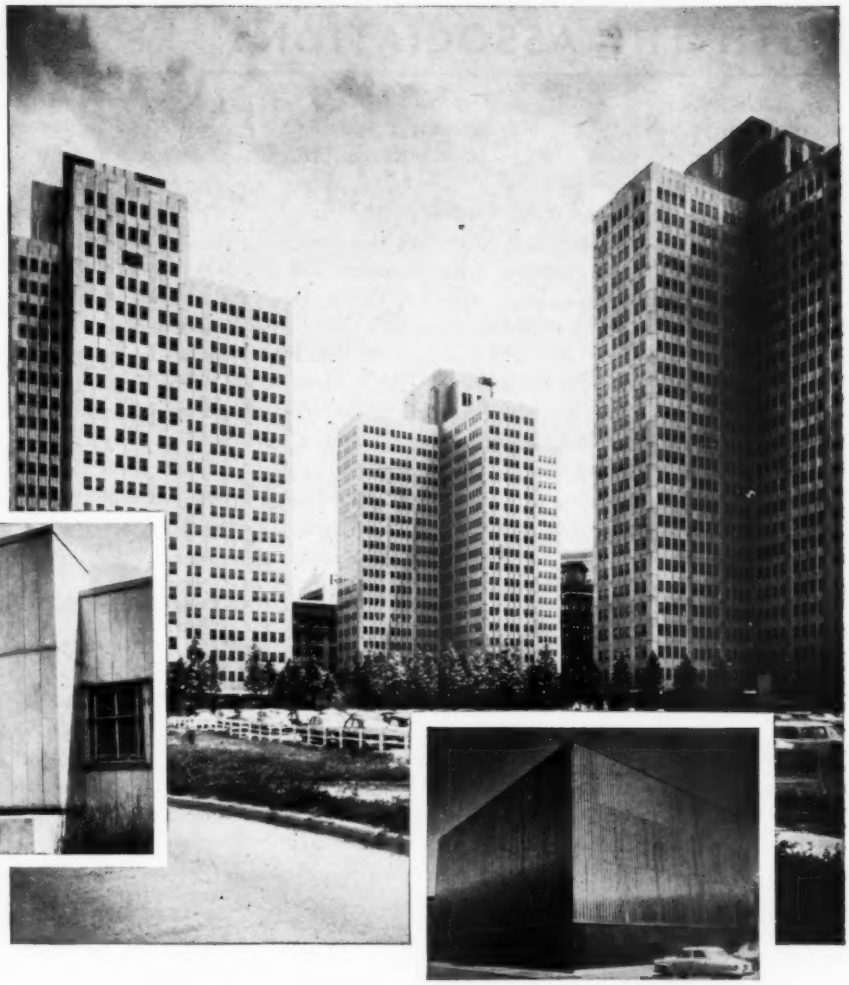
THE GAS APPLIANCE Manufacturers Association closed its 20th annual convention at Palm Springs, Calif. with the election of division chairmen, vice chairmen, and executive committee members who will administer its affairs during 1956. The 500 delegates, largest registration in the group's history, elected W. F. Rockwell, Jr., president of Rockwell Mfg. Co., as GAMA president to succeed T. T. Arden. The division chairmen, vice chairmen and executive committee members include the following:

*Regulator division*: chairman, Walter Lee, Major Controls Co.; vice chairman, Wayne Schutmaat, Penn Controls Inc.; executive committee member, Frank Kern, Jr., Maxitrol Co.

*Automatic Controls division*: chairman, Karl Schick, gas division sales manager of Minneapolis-Honeywell Regulator Co.; vice chairman, Ed Maire, vice president, Penn Controls Inc.; executive committee members, Frank Post of Robertshaw-Fulton Controls Co.; F. G. McCloskey, Crise Controls Div., Acro Mfg. Co.; D. J. Wood, Titan Valve Mfg. Co.

*Wall and Floor Furnace division*: chairman, Paul Hammond, Holly Mfg. Co.; vice chairman, Harley B. Weatherly, Chattanooga Royal Co.

*Furnace division*: chairman, Frank Meyer, president, Meyer Furnace Co.; vice chairman, E. A. Jones, director




Stainless steel curtain wall construction, as used (right) for the Gateway Center buildings in Pittsburgh; (below) for an industrial research laboratory; and (inset, right) to modernize an existing office building—illustrating the adaptability of curtain walls for all types of structures, large or small, new or old.

# YOU CAN BUILD FOR THE AGES . . . with a STEEL FOR THE AGES

What's the building on *your* mind? Maybe a big multi-story structure—or an industrial building, like our own Research Laboratory (see above)? Maybe a plant office building—or a bank, store, school, power station, warehouse, hospital, hotel? Or perhaps it's an existing structure that needs a face-lifting—modernizing the exterior, as well as the interior.

In any case, you're sure to consider *curtain wall* construction, because it's the newest, most modern method. Packed with advantages over masonry, too: such as fast, all-weather installation, more space per floor; more floors on a given foundation, etc. And you'll be equally sure to realize that *stainless steel-surfaced panels* (again, see above) promise the best long-term protection for the building investment. No other surfacing material is at once as hard, tough, strong, and lastingly beautiful, as impervious to wear and as resistant to heat and corrosive influences as stainless steel.

That's just why Allegheny Metal generally figures to last longer and cost less in the long run—wherever you use it. Let us help you to realize its benefits. ***Allegheny Ludlum Steel Corporation, Oliver Bldg., Pittsburgh 22, Pa.***

## "INFO" for Architects and Builders • • •

***Write for your copies***

1. "AL Structural Stainless Steels" —12 pages on stainless grades, properties, forms, finishes, standard "specs," uses and advantages.
2. "Stainless Steels for Store Fronts and Building Entrances" —40 pages of valuable data on examples and details. A1A File No. 26D.
3. "Stainless Steel Curtain Walls" —A 24-page progress report on methods. A1A File No. 15-H-1.

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of engineering, Century Engineering Corp.; executive committee member, G. W. Denges, vice president, The Williamson Co.

*Incinerator division*: chairman, Frederick H. Martin, vice president, Martin Stamping & Stove Co.; vice chairman, Don Winegardner, assistant sales manager, The Majestic Co.; executive committee member, Robert D. Smith, secretary-treasurer, Incinerator Products Co.

*Unit Heater and Duct Furnace division*: chairman, David R. Webster, president, Reznor Mfg. Co.; vice chairman, Thomas B. Bromley, vice president, Peerless Mfg. Corp.; executive committee member, James C. Patterson, manager, Carrier Corp.

*Vent Pipe division*: chairman, L. P. Brown, executive vice president, Van-Packer Corp.; vice chairman, Chester Blome, Metalbestos division of William Wallace Co.; executive committee member, B. A. Johnson.

## Plan Home Modernization Program

OPERATION HOME IMPROVEMENT, a year-long sales promotion campaign to make 1956 the biggest year ever known in the improvement of American homes, is well on the way to success, according to John R. Doscher. Mr. Doscher, executive director of the group, states that various elements of the building materials, home equipment and financing industries, including trade associations, manufacturers, financing interests, advertising agencies, national and trade magazines, are cooperating enthusiastically in the promotion. Under the sponsorship of the Chamber of Commerce of the United States, Operation Home Improvement will be launched officially by the Administration with a proclamation by HHFA Administrator Albert M. Cole to the effect that " '56 is Home Improvement Year."

Speaking of the degree of backing already achieved, Mr. Doscher stated that most of the major manufacturers of building materials and equipment are making plans now to use the Operation Home Improvement seal in their advertising schedules throughout the year. These manufacturers will also use the seal in all of their promotional and public relations efforts. Mr. Doscher said that a number of trade associations in the home improvement field are already at work tying in their efforts with Operation Home Improvement to gain maximum benefit for members.

## ASHAE Nominates Committee Members

A. B. ALGREN, professor of mechanical engineering at the University of Minnesota, has been nominated for membership on the council of the American Society of Heating and Air-Conditioning Engineers. Professor Algren, who is well known to the warm air heating industry, was president of the society's Minnesota chapter in 1933 and has served on the ASHAE research executive committee, committee on research and as a member and chairman of the Guide committee.

Frank H. Faust, manager of marketing research for the air conditioning division of General Electric Co., is a nominee for membership on the committee on research. Mr. Faust is presently a member of the standards committee and chairman of the ASHAE-ASRE committee on cooperation. Arthur Nutting, also nominated for membership on the research committee, is one of the authors of the article, New Air Filter Code which was published in the September 1953 issue of American Artisan. He is vice president and chief engineer of American Air Filter Co., and is also secretary-treasurer of the Air Filter Institute.

## Chicago Group Appoints Secretary

THE AIR CONDITIONING Contractors' Alliance has moved its office to 4049 W. Crystal St., Chicago, and has appointed Theodore A. Criel to serve as executive secretary. Jack Demling, assistant secretary of the Sheet Metal Contractors' National Association, is with the alliance in the capacity of attorney. The group has recently become a chapter of SMCNA.

## Canadian Heating Schools Scheduled

THE ANNUAL EDUCATIONAL program of the Canadian Chapter, National Warm Air Heating and Air Conditioning Association has gotten off to an early start this year. One school at Windsor, Ont. has already been held. Thirteen others are scheduled for the first four months of 1956. The four day program has been revised by the Technical Advisory Committee, headed by Jim Mitchell and Borden Cirka, newly appointed technical director. All the latest information on the installation and servicing of warm air heating equipment will be included in the course.

Schools scheduled are as follows:

| | |
|---|---|
| Hamilton, Ont. | Jan. 9-12 |
| Vancouver, B.C. | Jan. 16-19 |
| Edmonton, Alta. | Jan. 23-26 |
| Saskatoon, Sask. | Jan. 30-Feb. 2 |
| Regina, Sask. | Feb. 6-9 |
| Winnipeg, Man. | Feb. 13-16 |
| Toronto, Ont. | Feb. 20-23 |
| Brantford, Ont. | Feb. 27-Mar. 1 |
| Ottawa, Ont. | Mar. 5-8 |
| Montreal, Que. | Mar. 12-15 |
| London, Ont. | Mar. 26-29 |
| Quebec, P.Q. | Apr. 2-5 |
| Amherst, N.S. | Apr. 9-12 |

For further information write, D.M.W.Wilson, managing director, Canadian Chapter, National Warm Air Heating and Air Conditioning Assn., 4195 Dundas St. W., Toronto, Ont.

# the new PARKER-KALON plant

**Production facilities matched with an unequalled experience ... to offer you more assembly savings**

Starting with a revolutionary idea, the *original* Sheet Metal Screw, Parker-Kalon has become the leading manufacturer of Self-tapping Screws and other fasteners essential to low-cost assembly of thousands of products.

Industry's reliance on Parker-Kalon has brought about this growth, and the new P-K plant, in a real sense, was built to your specifications. In this great new plant, P-K Fasteners will be produced in larger volume to meet steadily increasing demand. Advanced engineering and laboratory equipment will also contribute to P-K progress in fastener research and development.

Parker-Kalon's unequalled "know-how" is now matched with the finest facilities for all operations. Now, more than ever, you can be sure . . . "If it's P-K . . . it's OK!"

**PARKER-KALON DIVISION • General American Transportation Corporation, Clifton, New Jersey**

**IN CLIFTON, N. J.** About 10 miles from New York City.

**267,000 SQUARE FEET** of floor space, with 225,000 sq. ft. for manufacturing: the remainder for offices, shipping, etc.

**PRODUCTION-FLOW DESIGN** Single-story construction, with layout that permits progressive flow of products through processing operations.

**MECHANIZED MATERIALS-HANDLING** Special conveyor systems and other modern equipment provide advanced degree of automation, and speed production.

**AUTOMATIC HEAT-TREATING** equipment, of P-K design, is typical of new production facilities for highest efficiency.

**ADVANCED QUALITY CONTROL** Newest inspection and testing equipment guards P-K quality standards.

**PACKING AND SHIPPING** area is fully equipped for rapid handling of large stocks and shipment of orders.

**AIR-CONDITIONED LABORATORY** provides all modern requirements for research, fastener development, and performance tests.

***SOLD THROUGH LEADING INDUSTRIAL DISTRIBUTORS***

### Coming Events

Jan. 22-26—National Association of Home Builders, annual convention. Conrad Hilton Hotel, Chicago. John M. Dickerman, Executive Director, 1625 L St., N. W., Washington 6, D. C.

Jan. 23-25—American Society of Heating and Air-Conditioning Engineers, Inc., annual meeting. Sheraton-Gibson Hotel, Cincinnati. A. V. Hutchinson, Executive Secretary, 62 Worth St., New York 13.

Feb. 2-3—Sheet Metal and Warm Air Heating Contractors' Association of Indiana, annual convention. Hotel Severin, Indianapolis. Frank E. Anderson, Executive Secretary, 439 S. 17th St., Terre Haute, Ind.

Feb. 5-8—New York Sheet Metal, Roofing & Air Conditioning Contractors' Association, annual convention. Hotel Utica, Utica, N. Y. Clarence J. Meyer, Executive Secretary, 567 Genesee St., Buffalo.

Feb. 6-9—Fifth Annual Industrial Ventilation Conference. Kellogg Center, Michigan State University, East Lansing, Mich. James C. Barrett, Division of Occupational Health, Michigan Department of Health, Lansing 4, Mich.

Feb. 16-18—Sheet Metal and Roofing Contractors Association of Minnesota, Inc., annual convention. Nicollet Hotel, Minneapolis. Tom Burnice, chairman, 4432 Chicago Ave., Minneapolis.

Feb. 20-22—Ohio Sheet Metal Contractors Association, annual convention. Biltmore Hotel, Dayton. Robert L. Butler, chairman, 138 Ringgold St., Dayton.

Mar. 11-14—Sheet Metal Contractors Association of Wisconsin, annual convention. Hotel Schroeder, Milwaukee. R. S. Schmieder, Executive Secretary, 8320 W. Bluemound Road, Milwaukee.

Mar. 22-23—Michigan Heating and Sheet Metal Association, Inc., annual convention. Hotel Fort Shelby, Detroit. N. J. Biddle, Executive Secretary 3035 E. Grand Ave., Detroit 2.

Mar. 23-24—Sheet Metal, Air Conditioning and Roofing Contractors' Association of Pennsylvania, annual convention. Penn Harris Hotel, Harrisburg. E. W. Liebermann, Secretary, 1411 Merchant Place, Ambridge, Pa.

Apr. 16-17—Sheet Metal Contractors Association of Illinois, Inc., annual convention. Abraham Lincoln Hotel, Springfield, Ill. Jay E. Harms, Secretary, 1619 N. Sheridan Rd., Peoria, Ill.

Apr. 19-21—Gas Appliance Manufacturers' Association, annual meeting. The Greenbrier Hotel, White Sulphur Springs, W. Va. H. Leigh Whitelaw, Managing Director, 60 E. 42nd St., New York 17.

May 7-9—Air-Conditioning and Refrigeration Institute, annual meeting. The Homestead, Hot Springs, Va. George S. Jones, Jr., Managing Director, 1346 Connecticut Ave., N. W., Washington 6, D. C.

May 9-12—Sheet Metal Contractors' National Association, Inc., annual convention. Shoreham Hotel, Washington, D. C. J. D. Wilder, Executive Secretary, 170 Division St., Elgin, Ill.

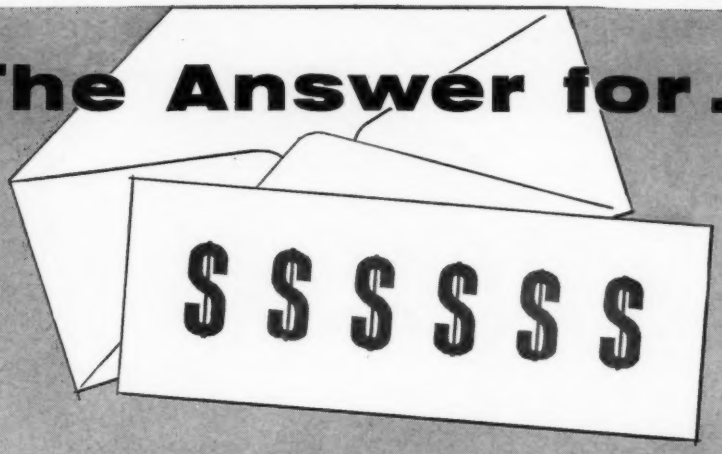
June 11-15—Oil-Heat Institute of America, Inc., exposition and annual convention. The Coliseum, New York, N. Y. R. H. L. Becker, Managing Director, 500 Fifth Ave., New York 36.

June 18-20—American Society of Heating and Air-Conditioning Engineers, semi-annual meeting. Shoreham Hotel, Washington, D. C. A. V. Hutchinson, Executive Secretary, 62 Worth St., New York 13.

June 21-24—Carolinas Roofing & Sheet Metal Contractors Association, annual convention. Ocean Forest Hotel, Myrtle Beach, S. C. Julian M. McKeithan, Secretary, 1219 Fairway Dr., Wilmington, N. C.

July 19-22—Roofing and Sheet Metal Contractors' Association of Georgia, annual convention. General Oglethorpe Hotel, Savannah, Ga. B. L. Noblitt, Secretary, P. O. Box 1196, Augusta.

# The Answer for . . .

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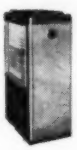
## The Answer to ANY Heating . . . Cooling . . . Year 'Round Air Conditioning Question

*Year 'Round Unit Basement-Utility 5 Ton Water Cooled*

*Year 'Round Unit Basement-Utility 2 or 3 Ton Air or Water Cooled*

*Year 'Round Unit Counterflow 2 or 3 Ton Air and Water Cooled*



*Summer Air Conditioner 2, 3 or 5 Ton Water Cooled*

*Summer Air Conditioner 2 or 3 Ton Air Cooled, Remote*

*Basement Winter Air Conditioner Gas or Oil Fired*

*Gas Fired Unit Heater*

*Counterflow Unit Gas or Oil Fired*

*Utility Unit Gas or Oil Fired*

*Gravity Furnace Gas or Oil Fired*

*Incinerator With or Without Gas Burner*

*Gas and Oil Horizontal Furnaces*

. . . is found in the "Years Ahead" Moncrief line. Because Moncrief units are *sized* right, *built* right and *priced* right!

With Moncrief, you get a greater selection . . . Gas, Oil and Coal Furnaces; Basement, Utility, Counterflow or Horizontal Winter Air Conditioners; Basement-Utility or Counterflow Year 'Round Air Conditioners; Air Cooled or Water Cooled Summer Air Conditioners; Gas or Oil Conversion Burners; Gas Fired Unit Heaters and Incinerators . . . a size, a type and a capacity for every installation!

With Moncrief, you get units that are backed by over 60 years' experience in the design and manufacture of better heating equipment . . . realistic experience that makes Moncrief units easier, quicker, less expensive to install . . . with extra years of service-free operation!

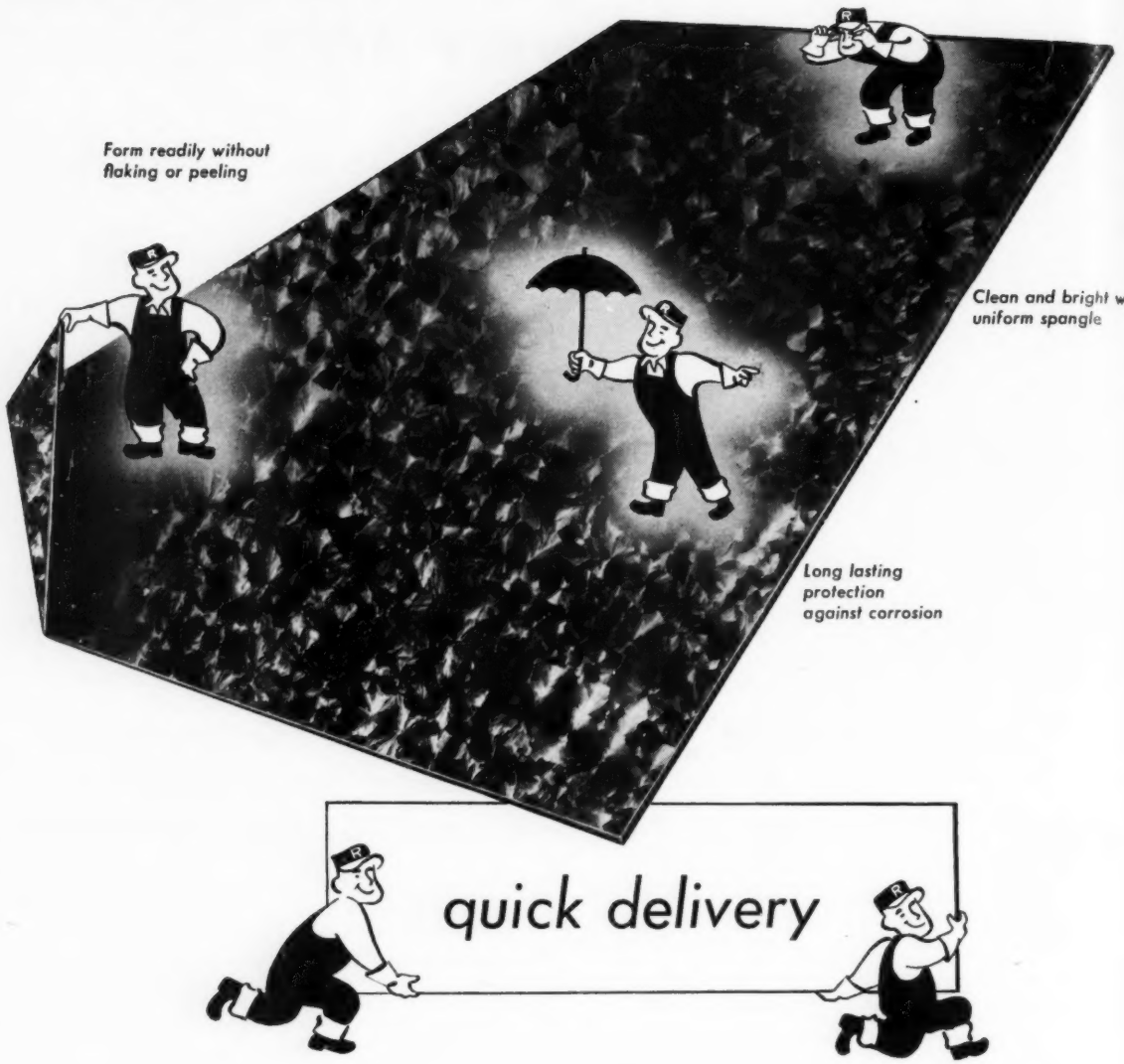
And with Moncrief, the price you pay is also to your profit advantage . . . a *competitive price*, competitive even in today's highly competitive market!

You can be assured that you can make your profit dollars shape up bigger . . . by calling your Moncrief Wholesaler!

*APPROVED for GAS or OIL!*

## THE HENRY FURNACE COMPANY ★ Medina, Ohio

HEATING AND AIR CONDITIONING UNITS — MONCRIEF — FURNACE PIPE AND FITTINGS


Form readily without flaking or peeling
Clean and bright with uniform spangle
Long lasting protection against corrosion
quick delivery

# Tight-Coat Quality Galvanized

You're sure of getting highest quality galvanized every time from Ryerson . . . and sure of getting what you want FAST because our stocks are the world's largest. We offer many gauges in a wide range of pattern sizes, as well as sizes cut accurately to your order.

Ryerson galvanized is made by a special continuous process that results in a tight bond of zinc coat to steel. This coating takes any forming the steel will take without flaking or peeling. And, tight-coated galvanized looks better, keeps rust and corrosion sealed out all over.

When you order galvanized from Ryerson, remember, you can also get quick shipment of every other steel requirement: hot and cold rolled carbon steel sheets, stainless, Ry-ex expanded metal, angles, bands, etc.

So, for whatever you need in steel, and for metal working machinery and tools as well, call your nearby Ryerson plant.

# RYERSON STEEL

JOSEPH T. RYERSON & SON, INC. PLANTS AT: NEW YORK • BOSTON • PHILADELPHIA • CHARLOTTE, N. C. • CINCINNATI • CLEVELAND
DETROIT • PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

# Where Does Profit Go?

WHILE TALKING WITH a warm air heating dealer who has been installing residential air conditioning equipment this year for the first time, we learned of his cost estimating technique and found some of the answers to the question, "Where did the profit go?"

This dealer carefully drew up a plan that outlined each step to be followed when submitting a bid on a residential air conditioning installation. This plan incorporated a room by room load estimate, shading recommendations (awning, shrubbery, etc.), utility availability, special duct fittings required, specific customer requirements, method for condensing refrigerant, equipment location, clearances, control system and house orientation. As each part of the installation was completed, a record was made of the cost involved. Upon completion of the job, the actual costs were compared with the anticipated costs. On the first job, the actual costs ran much higher than anticipated — so much so that there was no profit.

A careful analysis of the work procedure and handling revealed several operations that had not been included in the original bid. One of the problems involved the location of an air cooled condensing unit on a concrete slab placed in a narrow strip of land between the customer's house and that of a neighbor. After the installation was made, the neighbor asked to have the equipment moved because it extended 6 in. onto his property. The dimensions of the equipment prevented relocation within this strip of land; thus the condensing unit had to be moved around the corner, necessitating an extension of liquid, suction and power lines. This was at the expense of the dealer-contractor.

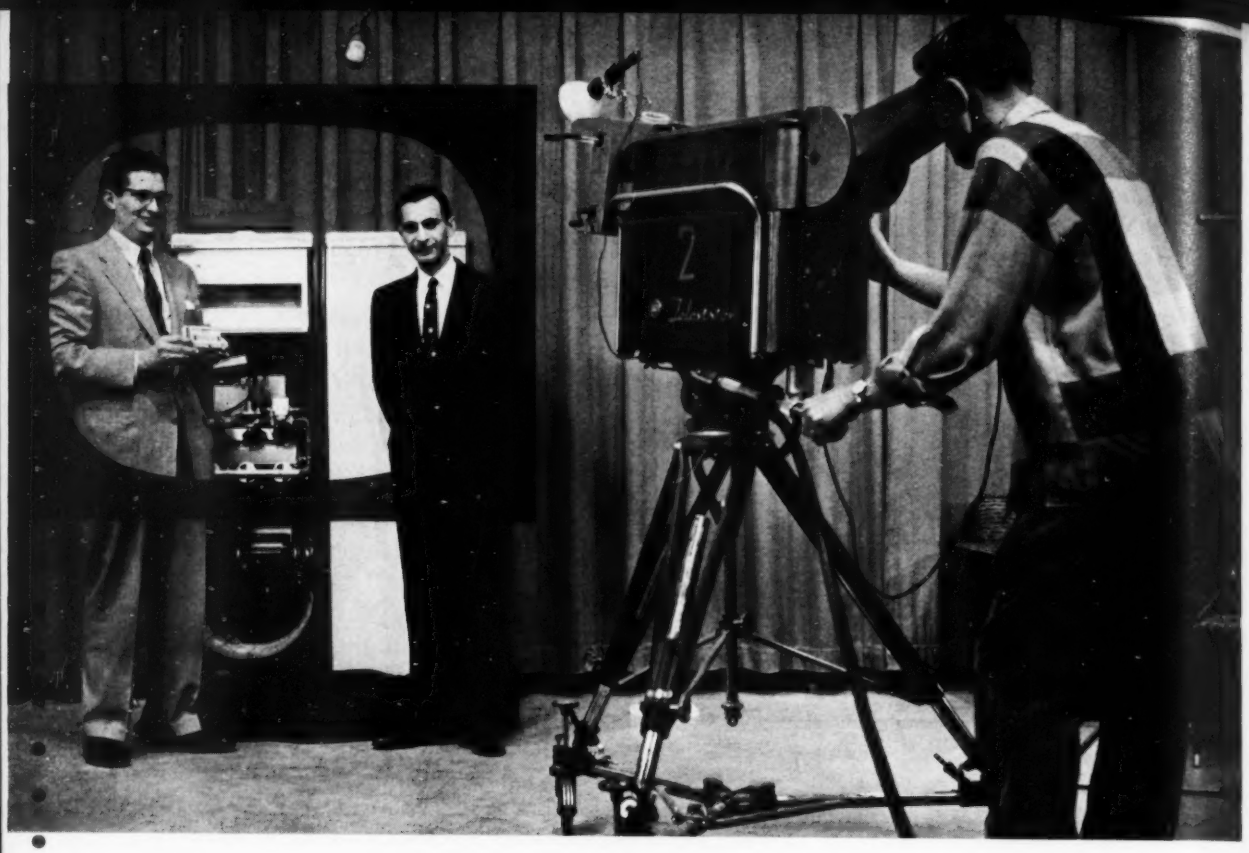
These operations were evaluated and included in the second air conditioning system sold. Once again a careful check of each operation was made upon completion of the job; each step again was evaluated. It was found that new operations again had consumed the anticipated profit.

A third air conditioning job was bid using the formula for determining costs as revised from the two previous installations, and this time other items of importance appeared in the job analysis along with a profit for the job.

To our way of thinking, this dealer has gone about the planning and supervising of work in the right way. He is measuring each step and weighing the results, readjusting his procedures and handling to the point where he can bid competitively and yet be sure of a profit for his organization.

In the early installations he found that not enough time was being given the actual work of installing and connecting the components. The time required for trips back to the shop for needed parts and tools was also greater than had been anticipated, and too little time had been allowed for the final checking and testing. On the first job, one year free service costs had not been taken into consideration.

The procedure used by this dealer is one highly recommended for all phases of the industry. It could apply all down the line with a resultant increase in profit for the dealer who takes the time to review his business techniques and to adjust his method of bidding to include all the work required of a first class installation. No effort can ever be considered as satisfactory — it's the dealer's responsibility to be forever aware of changing conditions and to learn how to solve the problems that go with them.



# Dealer Gets in the Act

***. . . by presenting in person his heating-cooling sales pitch to a market which has proved its responsiveness***

When a Sioux City, Ia. heating-air conditioning dealer worked up the courage to take his selling message before a television camera he started his firm on a sales road which has placed it in a position of sales leadership.

He is Sid Kalin, younger partner in Kalin's Furnace & Supply Co., who plays the dual role of salesman and heating-air conditioning expert before the large audience reached by Sioux City's station KTIV-TV each Thursday evening, and then spends the next six days following up the leads he develops.

Working toward the goal of making Kalin's synonymous with heating and air conditioning, Mr. Kalin and his father, Jake, have been playing their theme consistently via newspaper, radio and direct mail advertising for many years. But when television blossomed in Sioux City in 1954, they revised their advertising pro-

gram to exploit the new medium. They began to sponsor a weekly news program.

They experimented by switching from sponsorship of the news program to a late night movie, but later returned to the news program with its wider audience and became its exclusive sponsor.

At first they used a film supplied by a manufacturer, having the announcer introduce the commercial. Then they spotted in the film first and had the announcer close the commercial.

### See Need to 'Show How'

But they felt the message they had to tell could be given still further impetus with a more personal touch. Sid Kalin, with some public speaking experience in his background, was elected to appear on the program as a heating-air conditioning expert who would be interviewed by the announcer and would perform demonstrations using actual heating and air conditioning units installed on the set.

While appearing before the television audience required "some preparation and some courage," Mr. Kalin found that because of his experience in heating and air conditioning, he was able to explain the technicalities more succinctly and understandably than could an announcer. His television colleagues schooled him in the art of performing before the TV cameras, and with each appearance he became more at ease and better able to hammer home his message quickly and effectively.

Response was immediate. Sales began to climb. In the fall and winter, Mr. Kalin talked about controlled heat, automatic humidity control, compactness and efficiency of the heating units. He turned the equipment on to demonstrate the quietness of operation and quickly highlighted other features of the products displayed.

### Start Cooling Story in January

As early as January, the company began promoting the advantages of air conditioning. As the weather became warmer they stepped up the tempo of their air conditioning presentation. When the temperature reached 108 F in Sioux City, Mr. Kalin was on the spot hammering home the comforts of cool, refreshing, filtered air.

Inquiries flooded the company offices. Three men, Jake and Sid Kalin and Russel Banwart, plant engineer, followed up the prospects and in the summer of 1955 set a new record in sales of air conditioning units.

Necessarily, much of the company's advertising is of an institutional nature. Its effect might not be felt for six months or a year. But the purpose of the television presentation is to instill in the minds of the vast audience the fact that Kalin's represents the ideal combination of quality equipment plus service and installation know-how.

They promote new heating and air conditioning units and discuss conversion possibilities, and they talk about the company's 35 years experience in providing comfort for many of the city's homes. They stress neatness and efficiency of workmanship. To emphasize sales points to the TV audience Mr. Kalin removes working parts from the units and briefly explains their functions.

Mr. Kalin's popularity continues to rise and prospects often remark that they remember seeing him on television. The company feels it has hit on its most effective advertising approach, and the owners are convinced they have reached the point where their live television advertising returns more value per advertising dollar than does other media.

Cost of the present television promotion runs about $90 a week and with the follow-up advertising placed in a daily newspaper and direct mail tie-ins, the total budget runs over $5000 a year. Before television, the firm had a comparable budget in newspapers, radio and direct mail.

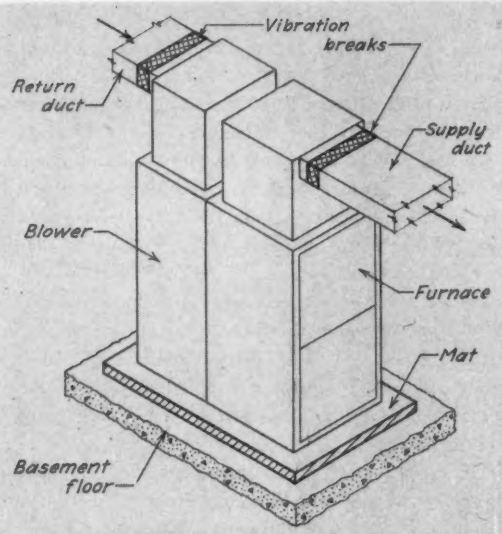
The entire campaign is handled by a local advertising agency which bases the company's promotion on the elements of consistency and persistency.

### Test Effectiveness of TV Promotion

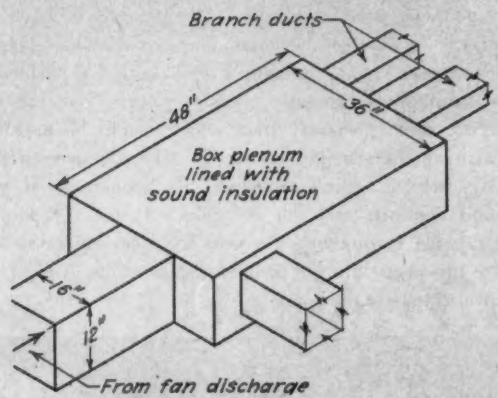
Convinced of the value of this comparatively new medium because of the coincidence of the shattering of sales records since Mr. Kalin's debut as a TV performer, the company is presently working on the possibility of offering some giveaway item which would be useful in measuring the strength of the TV advertising approach.

Meanwhile, Kalin's continues its promotion of year 'round comfort, and the company's theme, "Spring in your home throughout the year" is drawing more and more prospects into the company showrooms. And profits continue to rise.

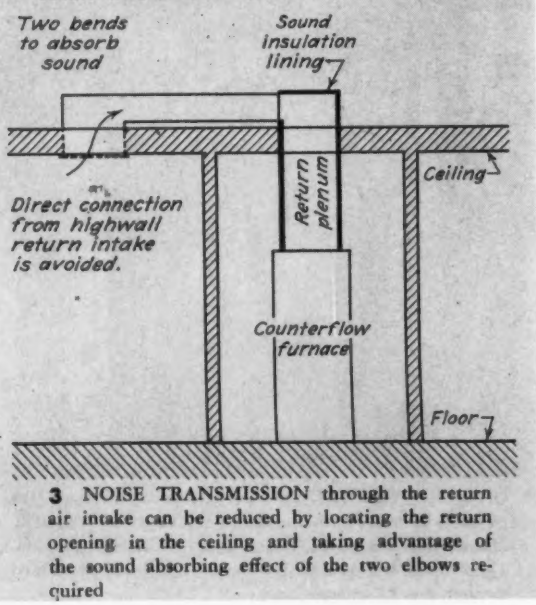
ONCE CONTACTED by the television message, the prospect is greeted in the firm's modern showrooms by (from left) Sid Kalin, Russel Banwart and Jake Kalin. These three are kept busy following up leads developed through the TV commercials




**1** RECOMMENDED PRACTICES in the reduction of noise start with flexible duct connections and base pads




**2** BOX PLENUM LOCATED in trunk line lined with sound insulation provides one way to reduce noise due to air flow




**3** NOISE TRANSMISSION through the return air intake can be reduced by locating the return opening in the ceiling and taking advantage of the sound absorbing effect of the two elbows required

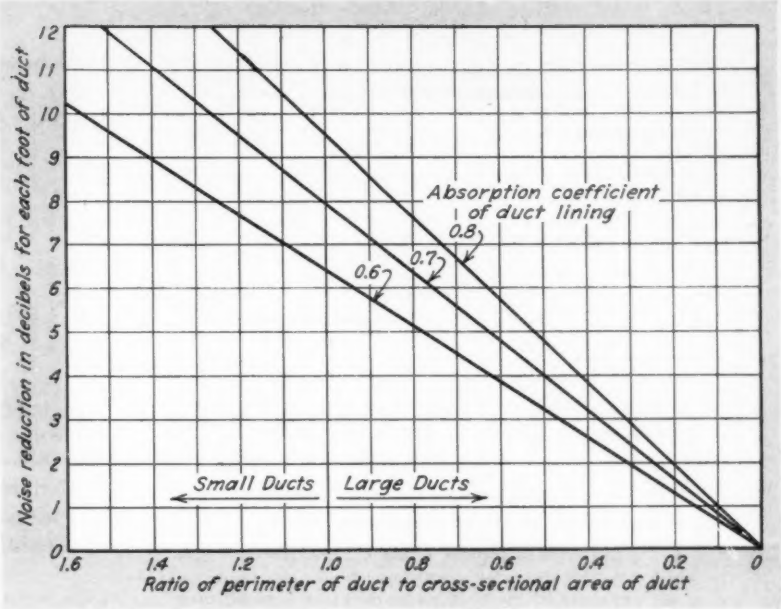
# Noise Can Be Controlled

**By S. Konzo and H. D. Bareither**
**University of Illinois**

ASSUMING THAT heating system noise has been found to be generated by the blower and the burner, the logical starting points for control would be the casing and plenums of the furnace:

*a*) If the furnace casing is vibrating, a flexible connection between the casing and the attached ducts (Fig. 1) will serve as a vibration break. Obviously, the manufacturer should make every effort to avoid the vibration that causes the disturbance. The installer of the equipment who is faced with a vibrating machine can minimize the transmission of the vibration by the use of a fire resistant, flexible connector or one of the special tapes manufactured for this purpose. L. L. Beranek has stated that the use of a flexible vibration break showed a reduction of as much as 10 decibels in some frequency bands.

Some sort of vibration isolation mat such as shown




**4** RELATIONSHIP between sound insulation, cross section area, duct perimeter and the reduction in noise to be expected per ft of duct can be calculated from this data tabulated in the research laboratory

**. . . if you know what causes the annoying sound and what treatment to render. Studies point out good practices and indicate how to install the equipment to handle air and machinery noise**

under the furnace in Fig. 1 can play an important part in noise reduction, and is equally as useful for absorbing noise from the blower, motors and all other vibration producing equipment in the heating system.

*b*) The reduction in decibels at the plenum was shown by R. W. Ferris and W. S. Young, Jr. to be:

$$\textit{Reduction in Decibels} = 10 \log_{10} (A_p\, a/A_f)$$

in which $A_p$ is the interior surface area of the plenum in sq ft; $a$ is the absorption coefficient of the surface per sq ft; $A_f$ is the area of the fan discharge in sq ft

Given a fan discharge duct that is 16 × 12 in., for which $A_f$ is 1.33 sq ft (see Fig. 2), assume the use of 1 in. sound absorbing duct insulation having an absorption coefficient of about 0.7 over the average range of frequencies, and the use of a 48 in. long, 36 in. wide, and 12 in. high plenum box. The value of $A_p$ is roughly 32 sq ft. The reduction in decibels is: 10 log 16.8, or 10 × 1.225, or 12.25 decibels. In this example, the plenum area was about 16.8 times the fan discharge area. Ferris and Young believe the plenum area should be at least ten times greater than that of the fan discharge.

*c*) When the return air intake grille is located close to the furnace and the blower, a possibility exists of having the noise of the furnace megaphoned into the living space. This condition is frequently encountered with a counterflow furnace in which the return air intake is connected to the side of the furnace by a short stub duct. A blower located at the top of the furnace casing is within a few inches of the intake opening, and blower noise is transmitted directly to the room (see Fig. 3).

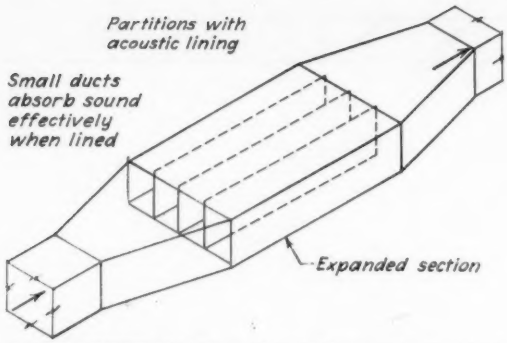
### Insulate Ducts and Return Plenum

One means of reducing the noise would be to use sound insulation in the short stub duct, although the distance is usually so short that such insulation alone may not be sufficient. A more effective method would be to install sound insulation in the return plenum. Or the return intake could be relocated in the ceiling so the return duct connection would be longer and could contain some elbows. Obviously, a reduction in blower speed will reduce noise, although such a reduction may not be possible without affecting the performance of the system.

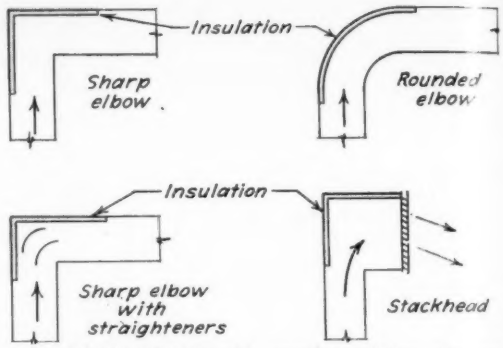
### STANDARDS FOR EQUIPMENT NOISE

**. . . established in last month's discussion and based on the dealer's ability to evaluate are as follows:**

| | |
|---|---|
| **CLASS A:** | **Equipment is quiet and sound is not noticeable** |
| **CLASS B:** | **Equipment is quiet but sound is noticeable** |
| **CLASS C:** | **Equipment noise is loud but not objectionable** |
| **CLASS D:** | **Equipment noise is loud and objectionable** |




**5** EXPANDED DUCT section with acoustic partitions provides an effective way to exercise noise control




**6** ELBOWS LINED with sound insulation also are effective ways to reduce blower and motor noise

*a*) Farris and Young state that noise reduction by the use of duct insulation can be expressed as follows:

$$\text{Reduction in decibels} = 12.6\, a^{1.4}\, (PL/A)$$

in which $a$ is the absorption coefficient of the duct insulation; $P$ is the perimeter of the duct; $A$ is the cross sectional area; and $L$ is the length in feet of the insulated portion of the duct.

The fact that the equation contains a term raised to the 1.4 power makes it inconvenient to use. Farris and Young have prepared a table which shows values for the term $12.6\, a^{1.4}$ for known values of $a$. These are as follows:

| Values of $a$ | Values of $12.6\, a^{1.4}$ |
|---|---|
| 0.4 | 3.7 |
| 0.5 | 4.9 |
| 0.6 | 6.4 |
| 0.7 | 7.9 |
| 0.8 | 9.5 |

Assume a 16 × 8 in. duct which is 1 ft long is lined on the inside with a duct insulation having an absorption coefficient of 0.7. The reduction in decibels per foot of duct would then be equal to 7.9 × (48/128) or practically 3 decibels per foot of duct (see Fig. 4).

*b*) In connection with sound absorption coefficients, the following typical values for a commercially available type of flexible duct liner is of interest:

| Sound Absorption Coefficient | For Frequencies of |
|---|---|
| 0.16 | 125 |
| 0.46 | 250 |
| 0.46 | 500 |
| 0.74 | 1000 |
| 0.83 | 2000 |
| 0.80 | 4000 |

This type insulation is more effective for high frequency sounds than for low frequency sounds.

*c*) The preceding equation demonstrates that noise reduction is more effective if the length of the insulated portion of the duct is greater. Therefore it would seem that the length of treated duct should be calculated using some rule that takes economy and effectiveness into consideration. Some test findings suggest that an effective length for treated duct would be equivalent to ten diameters or ten times the average duct dimension. The greatest reduction is obtained in the first few feet of lining.

*d*) The equation also shows that the decibel reduction is proportional to the ratio of $P/A$, or the perimeter over the area. In general, small insulated ducts show a more effective sound reduction characteristic than large ducts.

This principle has been utilized in the construction of so-called sound boxes, which are sound absorbing units designed to provide maximum noise reduction with minimum resistance to air flow.

## Subdivided Duct Cuts Noise

This same principle can be utilized in an expanded duct section that is broken up into a number of smaller passages, each of which is lined with sound insulation (see Fig. 5). According to L. L. Beranek, a reduction of 19 to 45 decibels is possible by using a duct that is subdivided into cells.

*e*) Sound is reflected at bends, elbows, splitters, and at any abrupt changes in area. According to J. S. Parkinson, these reflections affect the low frequency sounds below 500 cycles, which are characteristic of the noise from blower and motor. In other words, the high frequency noise due to air rush can be absorbed by duct insulation, whereas the low frequency blower and motor noise is best remedied by reflections at bends and elbows (Fig. 6).

Noise reductions for each bend and elbow are said to range from 1 to 3 decibels each, with even larger allowances for changes in area such as occurs when a side duct branches off from a main duct. Unfortunately, bends and elbows add frictional resistance to air flow, so they cannot be added merely for the purpose of reducing noise.

*f*) The heating dealer can also utilize the skills of the sheet metal trade to keep noise levels at a minimum by seeing that:

1) large duct sections are cross braked to prevent their popping in and out as the internal air pressure is varied;

2) large duct sections are braced to avoid resonance and drumhead sound effects;

3) any unnecessary sharp obstructions are avoided in the air passage — a sharp edged or loose damper or a sharp corner in a high velocity air stream can produce turbulence and air noise;

4) long stack lengths do not produce expansion noises (the duct must be allowed to adjust to temperature changes);

5) ducts which run through noisy areas are

covered on the outside with absorbing material and should be provided with flexible connections; otherwise the noise will be picked up by the duct and then transmitted to a quiet area.

Some interesting observations on noise reduction in registers and grilles are worthy of note:

*a*) The noise generated by air rushing out of a duct opening (Fig. 7) has been estimated by W. W. Soroka to be equal to:

$$\text{Decibels at outlet} = 65.5 \log V + 12 \log d - 200.6$$

in which $V$ is the outlet velocity in fpm; $d$ is the duct diameter in inches.

Given a 12 in. diameter duct with air leaving at 1000 fpm, where decibels $= 65.5 \times 3.0 + 12 \times 1.079 - 200.6$, or 8.8 decibels. On the other hand the same duct carrying air at 4000 fpm will have a decibel level of $65.5 \times 3.602 + 12 \times 1.079 - 200.6$, or 48.3 decibels. The air leaving at 1000 fpm would not be noticeable, whereas the air with 4000 fpm velocity would be distinctly loud. The equation suggests that the air velocity at the outlet is the most important factor, however a larger duct does have a tendency to increase noise when the same velocity is involved.

*b*) When a register or grille is placed in front of a duct opening the noise generated at the register is dependent on the type of grille as well as the velocity of the air. For example, P. H. Geiger showed that noise increased as the air was given a wider spread at the register face (Fig. 8). Register *A* has vertical fins, placed to give a large spread. Register *B* is a honeycomb type giving a small spread, and *C* is a plain perforated grille.

The three curves in Fig. 8 may be considered typical of the types of registers and grille described, but accurate estimates of noise from any given type of register or grille require use of data provided by a manufacturer.

*c*) If the same air velocity is maintained through two registers of the same type, but the size is increased, the noise will also be increased.

If, however, the increase in size is made with no change in air flow rate, then the velocity will be decreased and so will the noise.

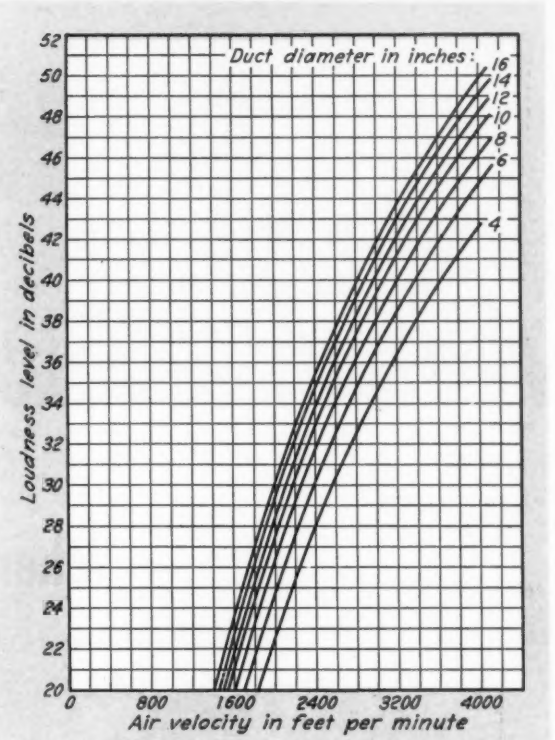
*d*) The use of low velocities is the simplest way to minimize noise at the register. However, if long throws of air are required, high velocities are necessary.

## Try to Shorten Air Throw

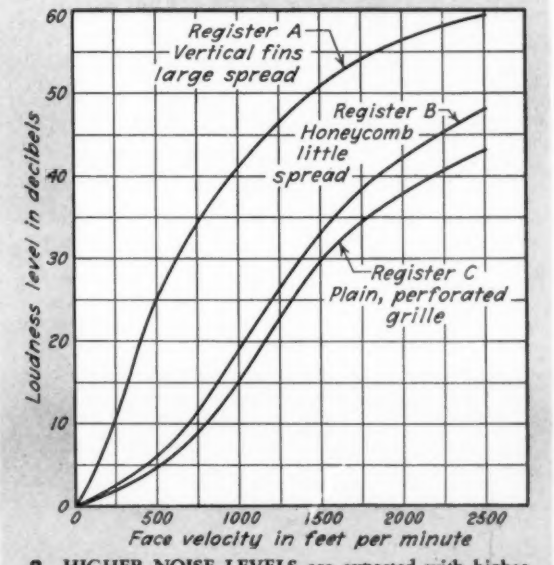
In many cases heating plans can be altered to shorten the throw of air by adding more supply openings in a room and by directing the air to a given part of the room. rather than trying to throw the air to cover a distant area.

*e*) Sound traps, used behind the register face, are primarily effective in reducing higher frequency sounds, such as those created by air rushing over sharp objects.

Considering all sides of this question of air noise and equipment noise it appears that the responsibility for a quiet system depends on good design by the manufacturer and good practice on the part of the heating dealer.



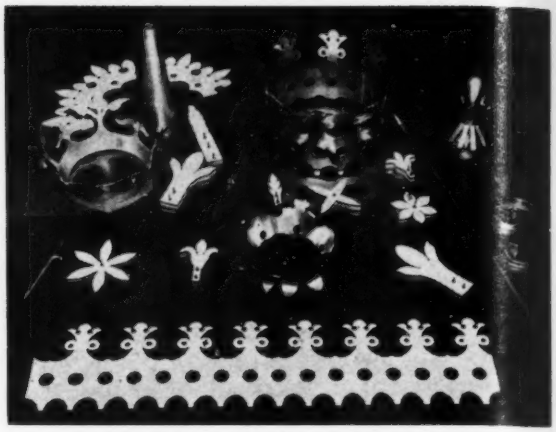

**7** AIR VELOCITY at a discharge opening alone is not responsible for air flow noise; the size of the discharge duct also enters into the evaluation of the decibel rating




**8** HIGHER NOISE LEVELS are expected with higher air velocities but the construction features of the register have much to do with the decibel rating

In general, high velocity air distribution leads to noise, and the use of sound reduction methods becomes of greater importance. If the dealer is willing to spend the time and effort required, the reduction of objectionable noise can be accomplished.

DISNEYLAND CASTLE would appear far more ominous if the sheet metal trimmings had been omitted, but . . .



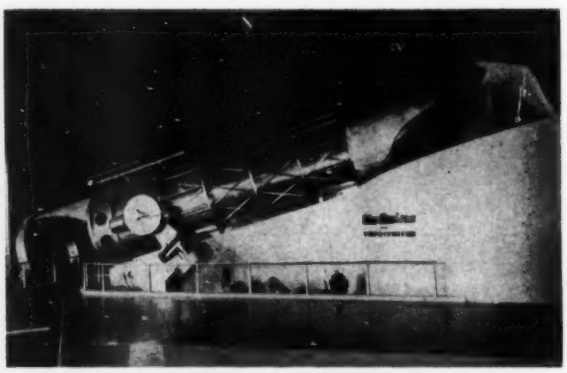
. . . the skill of the artisan sheet metal worker is demonstrated in these finials and crests, making Fantasyland appear more inviting

# Disneyland — Where Sheet Metal Is King

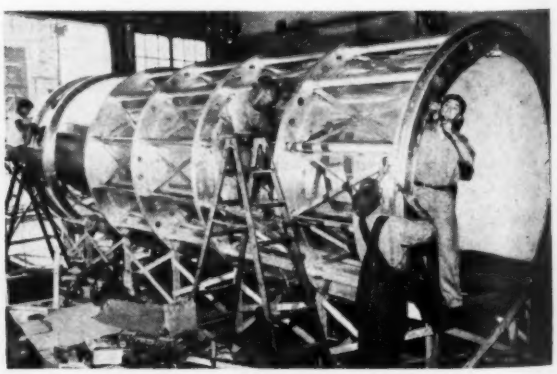
## . . . and every display is a tribute to the skill and imagination of the sheet metal worker

THE FAME of Disneyland is growing. It has become a *must* on any sightseeing tour of the Los Angeles area. What the thousands of visitors don't know is the importance sheet metal is playing in making their tour of the land of make believe as realistic as possible. The illustrations on these pages show some of the applications of sheet aluminum, demonstrating how the craftsmanship of the sheet metal worker has made it possible to reproduce the wonders of the world of long ago — both real and fictional — and to bring into being, during our era, facsimiles of the wonderful devices and buildings of the future.

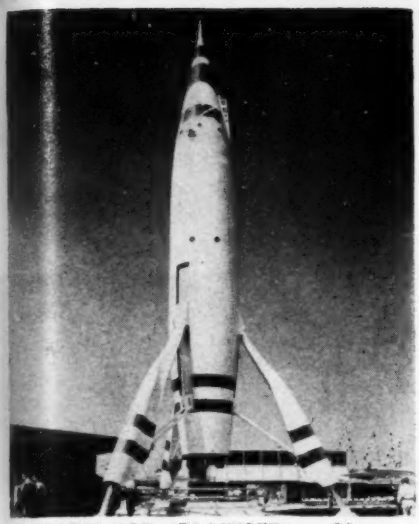
Aluminum sheet is employed here not only decoratively but also in many functional applications. Sometimes it is used in its natural state, in other cases it has been anodized with gold and applied in thin layers to laminated wood backing for rigidity. Architecturally it has been used for doors, sills, flashings, registers and receptacles.



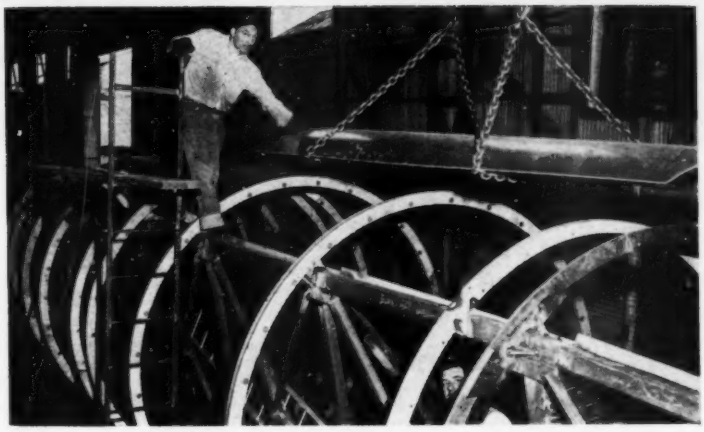
TOMORROWLAND BECOMES REALITY when visitors peer into this 40 ft telescope to see liquid metal poured from a large crucible . . .



. . . into 2 ft sheet metal stars. The telescope is made of aluminum sheet, weighs 3000 lb and is 8 ft in diameter — another fine example of sheet metal handicraft

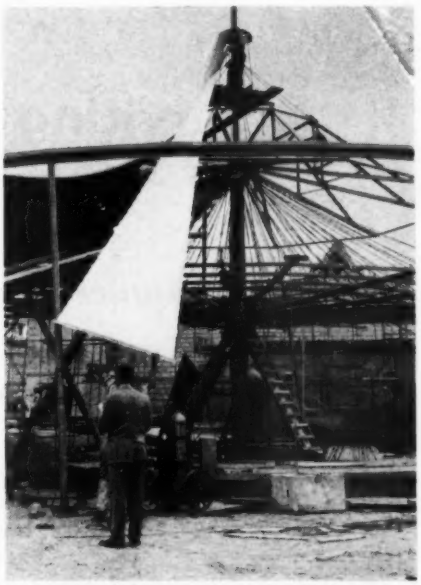


READY FOR "BLASTOFF" at Moonride theater is 80 ft rocket ship, 27 ft in circumference with . . .

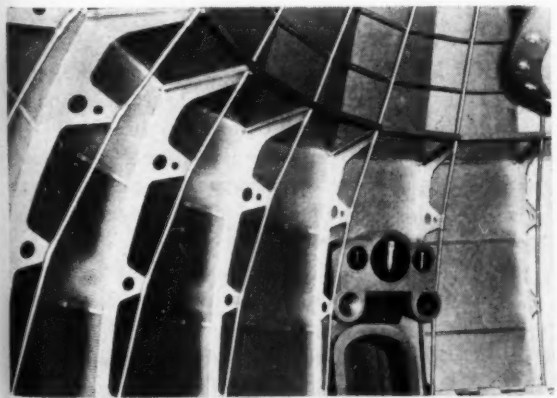


. . . skin made of 3/16 in. aluminum sheets. The sheet metal is welded to contour rings and steel framework for support

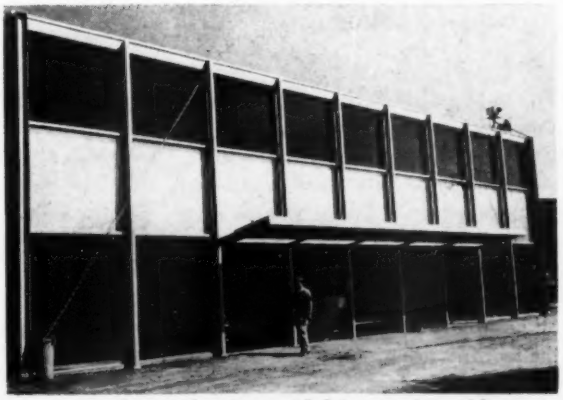
KNIGHTS OF OLD and men of tomorrow ride together on King Arthur's carousel. Dragons, knights, gallant steeds are . . .



. . . shielded from the weather by decorative metal canopy. Gores 40 ft 10 in. long were erected by a crew of three after being trimmed from 5 ft 6 in. at the outer edge to 3 in. at the inner point



INTERIOR OF CURTAIN WALL panels was used for the Moonride theater where simulated space flights take place. Perforated sheets contribute to soundproofing while . . .



. . . weatherproofing is provided by exterior gold anodized sheets. Embossed outside sheet is laminated to a paper honeycomb sandwich filling. Photos courtesy Kaiser Aluminum & Chemical Corp.

**Engineering . . .**

**Installing . . .**

**Servicing . . .**

*Modern Techniques Require Knowledge of*

# Refrigerant Line Sizing

**. . . for remote installations. Procedures must be based on known data. Ability of the equipment to deliver rated capacity is directly related to the care exercised in selecting liquid and suction line sizes**

**By S. W. Reid**
**Air Conditioning Engineer**
**Gilbert Associates, Inc.**

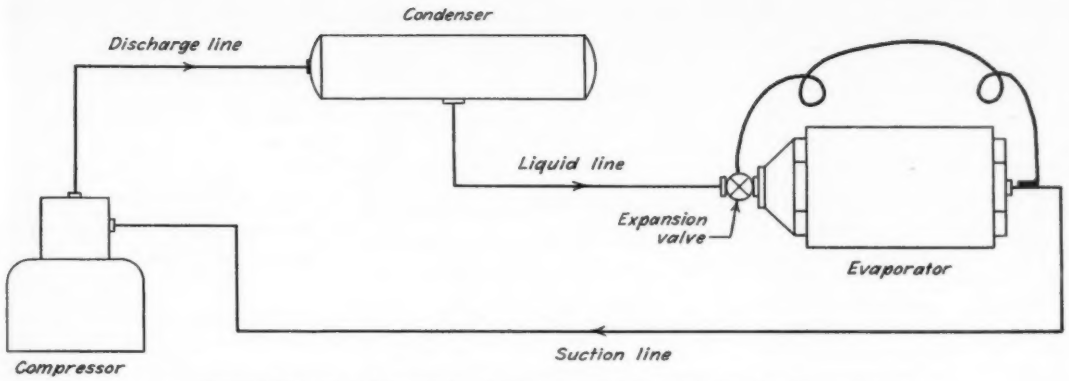
THERE IS AN old saying that a chain can be no stronger than its weakest link. This truism is applied to many situations, especially those where a result is achieved by the interaction of more than one component part. Since cooling falls in this category, it would seem fair to state that overall performance can be no better than the performance of any single part of the system. When speaking of such a system one normally thinks of the compressor, evaporator and condenser. Sometimes the expansion device is remembered, but seldom does one list interconnecting piping in the same category with the "engineered" components. Yet, refrigerant piping and tubing must be engineered if it is to serve its purpose efficiently so that it does not become the weak link in an otherwise properly designed system.

Before the days of the complete, factory built cooling package, the dealer had to know something about refrigerant piping, since it was his responsibility to pipe up the various components of even the smallest system. This is still necessary today for large tonnage installations. Dealers who have entered the air conditioning field during the era of packaged equipment have only recently been called upon to design refrigerant piping. Their lack of experience has shown up in the application of some of the new residential equipment with remote cooling coils or remote (from the compressor) air cooled condensers. The trend back toward this type of equipment is making it necessary for the dealer again to become acquainted with the fundamentals of correct piping.

Fig. 1 shows the following refrigerant lines which will be discussed in this article:

1) The discharge line which carries hot gas from the compressor to the condenser.

2) The liquid line which carries refrigerant in liquid form from the




**1** REFRIGERANT LINES under discussion are: discharge line from compressor; liquid line from condenser; suction line from cooling coil

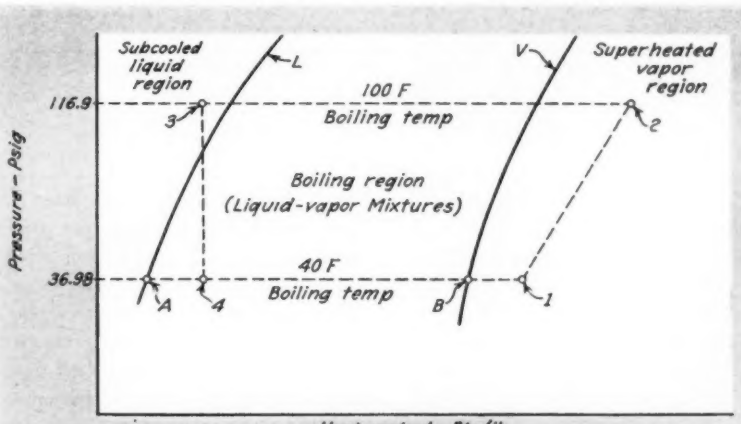
condenser to the cooling coil.

3) The suction line which carries cool gas from the cooling coil to the compressor.

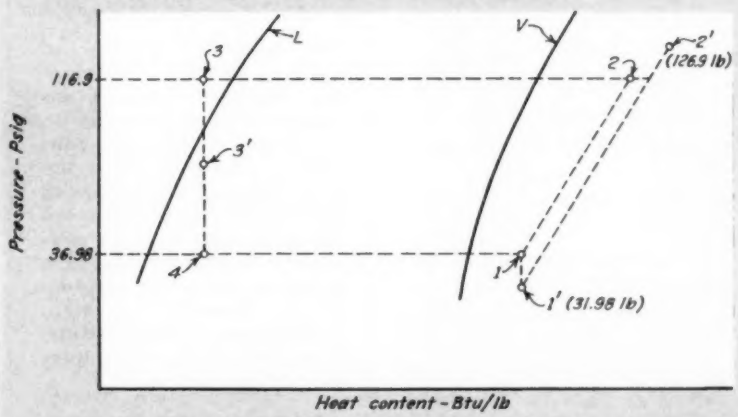
## Review Refrigeration Cycle

Before getting into detailed discussion concerning each of these lines, it will be well to review the operating cycle of a refrigerating system to see how the size of lines affects performance. A pressure-heat diagram, such as shown in Fig. 2, is the most convenient one to use for this purpose. It will be noted first of all that values on the vertical scale represent pressure in psi, and those on the horizontal scale represent heat in Btu per pound. Two pressures, 36.98 psig and 116.9 psig, are indicated by the dotted horizontal lines. For each of these there are corresponding boiling temperatures which for fluorinated hydrocarbon refrigerant (No. 12) are shown to be 40 F and 100 F respectively. If we draw a series of lines at other pressures between the two shown and plot on each the heat content value at the boiling temperature for liquid and vapor, we establish lines *L* and *V* respectively.

On any constant pressure line, such as the 36.98 psig line, a pound of refrigerant having less heat than represented by the intersection of the pressure line and line *L* (point *A*, Fig. 2) would be at a temperature less than the boiling temperature, which for this pressure is 40 F. For this reason, the region to the left of line *L* is known as the subcooled region. At saturation point *A* the liquid refrigerant has taken on all the heat it possibly can and has reached the highest temperature possible without starting to boil. If more heat is added




**2** PRESSURE-HEAT DIAGRAM for fluorinated hydrocarbon refrigerant (No. 12) is most convenient method of checking the effect of refrigerant line size on performance




**3** UNDERSIZED REFRIGERANT lines cause pressure losses. Refrigerant leaves evaporator at point 1; enters compressor at 1'; leaves compressor at 2'; enters condenser at 2; leaves compressor at 3; enters expansion device at 3'; enters evaporator at 4

**TABLE 1 — COMPRESSOR CAPACITY is affected by pressure losses in suction and discharge lines**

| Gas Entering Compressor | | Gas Leaving Compressor | | Compressor Capacity | Compressor Capacity | Compressor Power | Bhp per Ton |
|---|---|---|---|---|---|---|---|
| Point on Fig. 3 | Pressure (psig) | Point on Fig. 3 | Pressure (psig) | (Btuh) | (Tons) | (Bhp ) | |
| 1 | 36.98 | 2 | 116.9 | 23,000 | 1.92 | 2.36 | 1.23 |
| 1 | 36.98 | 2[1] | 126.9 | 22,000 | 1.82 | 2.48 | 1.36 |
| 1[1] | 31.98 | 2 | 116.9 | 20,000 | 1.68 | 2.32 | 1.39 |
| 1[1] | 31.98 | 2[1] | 126.9 | 19,000 | 1.58 | 2.42 | 1.53 |

**TABLE 2 — RECOMMENDED VELOCITY and pressure drop limitations will facilitate refrigerant line sizing**

| Refrigerant Line | Total pressure drop (psig) | Velocity (fpm) |
|---|---|---|
| Discharge | 2 to 4 | 1000 to 5000 |
| Liquid | 3 to 5 | 100 to 250 |
| Suction | 1 to 2 | 500 min. horiz.<br>1000 min. vert.<br>2000 to 5000 max. |

**TABLE 3 — TONNAGE CAPACITIES for refrigerant No. 12 are based on refrigerant line size, pressure drop and use**

| Line Sizes | | Discharge | | | | | Liquid | | | | | Suction | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Outside Diameter (Inches) | Inside Diameter (Inches) | 50 ft Max. Pipe Length Total press. drop (psig) | | | | | 50 ft Max. Pipe Length Total press. drop (psig) | | | | | 50 ft Max. Pipe Length Total press. drop (psig) | | | | |
| | | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 | 1 | 2 | 3 | 4 | 5 |
| 1/2 | 0.430 | | | | | | 1.5 | 2.2 | 2.8 | 3.3 | 3.7 | | | | | |
| 5/8 | 0.545 | 0.6 | 0.9 | 1.1 | 1.3 | 1.4 | 2.8 | 4.2 | 5.3 | 6.2 | 7.1 | 0.4 | 0.6 | 0.8 | 0.9 | 1.0 |
| 7/8 | 0.785 | 1.6 | 2.3 | 2.9 | 3.5 | 3.9 | 7.6 | 11.1 | 14.0 | 16.5 | 18.7 | 1.1 | 1.6 | 2.0 | 2.4 | 2.6 |
| 1 1/8 | 1.025 | 3.2 | 4.8 | 6.0 | 7.1 | 8.0 | 15.5 | | | | | 2.2 | 3.2 | 4.1 | 4.8 | 5.4 |
| 1 3/8 | 1.265 | 5.7 | 8.4 | 10.5 | 12.4 | 14.1 | | | | | | 3.8 | 5.7 | 7.1 | 8.4 | 9.6 |
| 1 5/8 | 1.505 | 9.1 | 13.4 | | | | | | | | | 6.1 | 9.1 | 11.4 | 13.5 | 15.4 |
| 2 1/8 | 1.985 | | | | | | | | | | | 12.8 | 19.0 | | | |

Notes 1) All figures include allowance for pressure loss in average number of fittings
2) Figures apply for lines 50 ft long or less
3) Use the following factors for suction lines:

| | | | | | |
|---|---|---|---|---|---|
| Suction temperature (F) | 30 | 35 | 40 | 45 | 50 |
| Suction pressure (psig) of refrigerant 12 | 28.5 | 32.6 | 37.0 | 41.7 | 46.7 |
| Multiply table values by | 1.14 | 1.06 | 1.00 | 0.95 | 0.89 |

at the same pressure, liquid will change to vapor through a boiling process at 40 F constant temperature. At point *B* the refrigerant has become saturated at the 40 F temperature. It is all vapor in form. Any further addition of heat will cause a rise in temperature above 40 F, and the refrigerant becomes superheated vapor.

### Minimize Flash Gas

Now let us follow the flow of refrigerant through an ideal cycle where there are no losses due to friction. Starting at point 1, superheated vapor leaves the evaporator and enters the compressor which raises its pressure. Theoretically, the hot vapor leaves the compressor and enters the condenser at point 2. In the condenser, heat is removed to change the vapor back to liquid form. Some subcooling may take place so that liquid is presumed to leave the condenser and enter the expansion valve or capillary tube at point 3. Passage through the expansion device is represented by the line 3-4 which, it should be noted, intersects line *L*. It is not possible to reduce the pressure of a pound of liquid from point 3 to point 4 without causing some of the refrigerant to change to vapor. Vapor which forms in the pressure-reduction process is called flash gas. Because it can be very troublesome, as will be discussed, steps must be taken in the design and installation stages to keep it to a minimum.

### What Is 'Air Conditioning'?

**The American Society of Heating and Air-Conditioning Engineers defines air conditioning as follows:**

**"The simultaneous control of all, or at least the first three, of the following factors affecting both the physical and chemical conditions of the atmosphere within a structure: temperature, humidity, motion, distribution, pressure, dust, bacteria, odors, toxic gases, and ionization."**

**Reference: Heating, Ventilating, Air Conditioning Guide 1955, page 1. Published by the American Society of Heating and Air-Conditioning Engineers, New York.**

### Small Lines Affect Performance

Now let us look at Fig. 3 which is essentially the same as Fig. 2 except that the system which it represents has undersized lines. Refrigerant vapor still leaves the evaporator at point 1 in a superheated state. Before it can enter the compressor however, it must pass through a suction line where an unavoidable loss in pressure takes place due to the resistance to flow which the line offers. We shall assume that the vapor actually enters the compressor at point 1′ which is 5 lb less than the pressure at point 1.

On Fig. 2 it was assumed that the compressed vapor left the compressor and entered the condenser at point 2. If, however, the discharge line between the compressor and condenser were to offer much resistance to flow, it would be necessary for the vapor to leave the compressor at some higher pressure in order to compensate for the pressure loss in the line. Let us identify this higher pressure as point 2′, Fig. 3 and assume that it is 10 lb higher than the pressure at point 2.

It is apparent from Fig. 3 that pressure losses in the suction and discharge lines cause the compressor to pump between pressures 1′ and 2′ instead of pressures 1 and 2. The penalty on compressor capacity and the effect on the horsepower required per ton of refrigeration is summarized in Table 1.

In Fig. 2 liquid refrigerant was presumed to leave the condenser and enter the expansion device at point 3. Since this point is in the subcooled liquid region, the expansion device was being fed "solid" (100 percent) liquid so there would be no difficulty in obtaining rated performance.

In Fig. 3 we interposed a liquid line, which is undersized, between the condenser and the expansion device. Since the line offers resistance to flow, there is a difference in pressure from one end to the other. Thus, under the condition in Fig. 3, liquid might leave the condenser at point 3 but due to liquid line pressure loss,

might enter the expansion device at point 3′.

### Flash Gas Lowers Capacity

Note that point 3′ is well within the boiling area between lines *L* and *V*. This tells us that flash gas has formed in the liquid line and that the expansion device is being supplied not with solid liquid but with a mixture of liquid and vapor.

There are two undesirable effects from an undersized liquid line. One is that the pressure differential across the expansion device is reduced by the amount of pressure drop which occurs in the liquid line. This reduces the capacity of the expansion device from what it would be if the full differential were available. The other effect is related to the extent that flash gas produced in the liquid line also effectively reduces the capacity of the expansion device, presuming it was selected to operate with solid liquid. Both gas and liquid must pass through the expansion device. The amount of liquid that can get through is reduced in proportion to the volume of gas that must get through. Only liquid has any refrigerating ability in the evaporator.

It has been shown that undersized refrigerant lines can reduce the capacity of a system by putting a penalty on the performance of the compressor and expansion device. For a given capacity it is, of course, possible to compensate for undersized lines by oversizing the compressor and expansion device. This procedure may be the only recourse in rare instances, but for most cases, the predetermination of line sizes which will have losses which can easily be tolerated is the logical procedure.

The choice of procedure to be followed in determining correct refrigerant line sizes is necessarily influenced by the degree of accuracy desired. Large systems where the cost of pipe is a major consideration justify careful and thorough analysis. The minimum and maximum refrigerant flow rates must be determined. With this information, equations or charts may be used to find the pressure loss per 100 ft of pipe for the several possible diameters for each of the three lines. From piping layouts, the actual length of each line is determined. To this is added the equivalent length of fittings, valves, etc. to obtain the entire equivalent length of each possibility. These values multiplied by the loss per 100 ft provide the total pressure losses to be expected. Table 2, compiled from American Society of Heating & Air-Conditioning Engineers Guide data, shows recommended velocities and total pressure drops, and is a guide in making final selections. It would not be practical for the dealer to use the basic method described above, since the information required is highly technical and is usually available only from manufacturers who have large engineering departments.

### Sizing Procedure Is Simplified

A somewhat simplified procedure for sizing refrigerant lines involves the use of tables included in ARI Equipment Standards — 1946, of the Air-Conditioning and Refrigeration Institute. These tables show maximum recommended tonnages for various line sizes and various pressure drops per 100 ft of equivalent line length. The tonnages fall within the limitations of Table 2.

For residential size systems where lines are relatively short, Table 3 may be used with sufficient accuracy for refrigerant No. 12. As pointed out in the notes applying to this table, allowance has been made for the average number of fittings so that it is not necessary to calculate the equivalent length of lines. Values given have been limited to residential tonnages. Selections should be made within the pressure drop limitations of Table 2. Information, in a slightly different form, for sizing refrigerant No. 22 lines is given in the ASRE Data Book chapter on Pipe and Piping.

### Consider Other Factors

There are some very important reasons for the limitations given in Table 2. Two effects of high pressure drops in liquid lines were discussed

**A CONTINUING SERIES**

**. . . of articles written for the residential air conditioning dealer points out the fundamentals of cooling equipment operation, application and maintenance. Management and engineering information has also been covered in the 40 articles listed here.**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**. . . . . Sept. 55**
**Applications (Bank)**
**. . . . . June 54**
**(Existing House)**
**. . . . . Aug. 52**
**(Two Story House)**
**. . . . . Nov. 53**
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previously. One other consideration with respect to liquid line design that must not be overlooked is the effect of static head loss. When the evaporator is above the condenser or receiver, the liquid must flow upward to the higher elevation. In so doing there is an approximate pressure loss of 0.57 psig per foot for refrigerant No. 12 and 0.51 psig per foot for No. 22. The effect of this pressure loss is exactly the same as if the loss had been caused by line friction. Where there is an indication that some liquid will vaporize before it reaches the expansion device, it is often possible to justify installing a heat exchanger to subcool further. This would move point 3 on Fig. 3 to the left so that line 3-4 would cross line *L* at a lower pressure.

With respect to suction lines, the minimum velocities shown in Table 2 have been found necessary for the purpose of carrying oil along with the refrigerant vapor. Under certain operating conditions, particularly upon start up, it is impossible to prevent some oil from leaving the compressor crankcase and moving through the system. Low suction line velocities might allow oil to accumulate in the line or in the evaporator. Damage to the compressor might result not only from a lowered crankcase level but also from the possibility that an accumulation of oil might slug back in a quantity large enough to damage the compressor valves. The latter effect however, would depend on the arrangement of piping to the compressor. High suction line velocities may be used provided the total pressure loss can be kept within the recommended values and provided noise does not become a factor.

### Try to Eliminate Oil Traps

Discharge lines, like suction lines, must be designed to handle oil properly. Although it is not a particular factor in residential systems, there are applications where line velocities must be studied for both light and heavy load operation. Piping layouts must always be checked for possible pockets where oil might accumulate instead of returning to the compressor crankcase. Horizontal suction lines should pitch toward the compressor, and horizontal discharge lines should pitch toward the condenser to aid in the flow of oil.

In addition to knowing how to size lines properly, the dealer should be familiar with other factors which make for good practice in installing refrigerant lines. Important specific requirements with respect to piping are set forth in the ASA B9 Safety Code for Mechanical Refrigeration which is sponsored by the American Society of Refrigerating Engineers. The aim of this code is to promote minimum standards of safety. Another excellent reference is the American Standards Association ASA B31 Piping Code.

## CHECK LIST FOR REFRIGERANT PIPING

ALTHOUGH AUTHORITATIVE CODES and ordinances take precedence over the suggestions given below, these might be used by the dealer as a guide to good practice in air conditioning refrigerant piping.

1) Copper tubing should be Type *L* or *K* bright annealed, dehydrated and sealed or Type *B* copper pipe. Soft temper tubing is usually used where bending is required, where tubing is hidden or where flare joints are used. Hard drawn tubing is used for silver brazed lines where fittings are used to avoid bending.

2) Flared joints may be used through 5/8 in. Larger joints should be silver brazed. Fittings should be wrought copper of forged brass sweat fittings. Cast sweat fittings should not be used.

3) Valves should be designed for fluorinated hydrocarbon refrigerant service and of the brass packless type or of the brass or steel seal cap type. Valves in copper lines smaller than 1 in. should be supported independently of lines.

4) Solenoid and expansion valves should be protected with a strainer upstream from them.

5) All lines should be run plumb and straight, and parallel to walls, except that horizontal suction lines, discharge lines and condenser to receiver lines should be pitched in the direction of flow. Valves in these lines should be placed with stems horizontal to avoid damming.

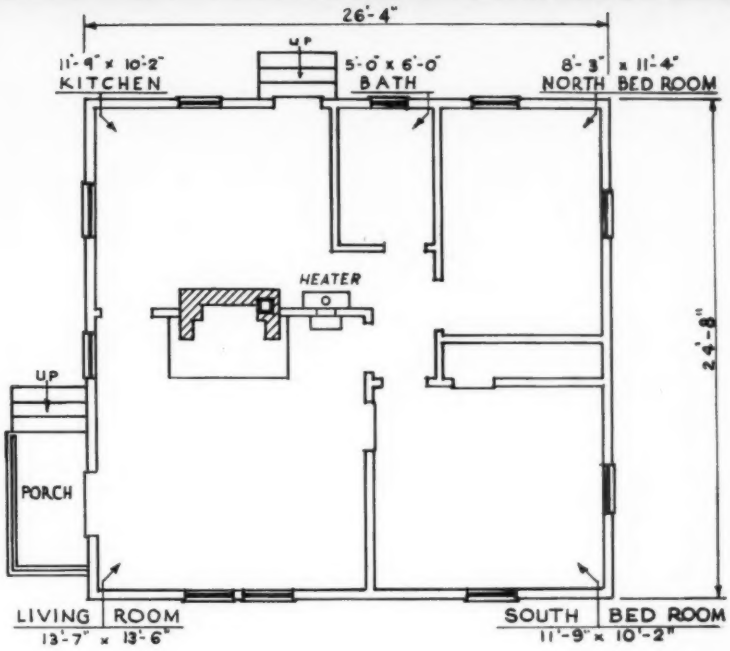
6) Pockets, unnecessary traps, turns and offsets should be avoided. Traps and pockets, where unavoidable, should have oil legs and drain valves.

7) Flexibility should be taken care of wherever possible by changes in line direction. The use of flexible joints should be kept to a minimum.

8) Insulation should be applied to all suction lines to prevent forming of condensate. Long suction lines and liquid lines should be insulated to keep heat pick up to a minimum.

9) Piping should be accessible for repairs and sufficient valves and fittings should be included for ease in disconnecting controls and equipment.

10) Refrigerant tubing and fittings should be pressure tested with at least 50 psig pressure before charging. Pressure may be applied with refrigerant, with a mixture of fluorinated hydrocarbon refrigerant and nitrogen or other dry inert gas or with an inert gas alone. Check all joints with full operating pressure after the system is charged.

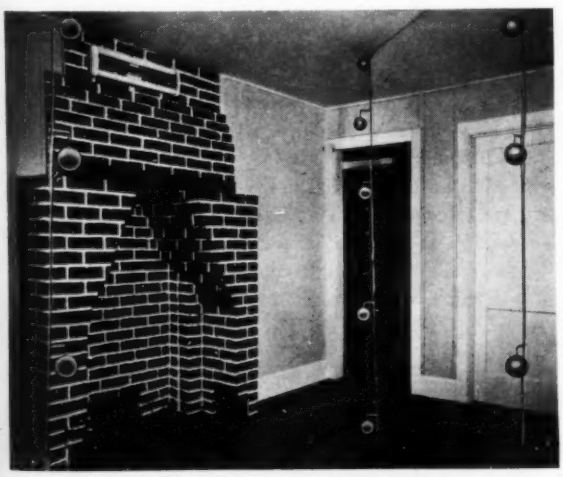



FLOOR PLAN of test bungalow shows central location of heating unit. Entire house is enclosed within an insulated shell so "outside" temperatures can be varied

# Here Are New Facts on Gravity Heating

## . . . in basementless homes under various test conditions — facts which will prove valuable to dealers in heating small residences

AN INVESTIGATION of the performance of a gas fired gravity furnace installed in a basementless house has been completed by the National Bureau of Standards. Sponsored by the Federal Housing Administration, the study was conducted in the Bureau's test bungalow by O. N. McDorman and P. R. Achenbach of the NBS heating and air conditioning laboratories. The purpose was to determine the temperature distribution produced in the test bungalow by a typical gravity furnace installation using either gravity circulation of the air or a small booster fan. Horizontal and vertical temperature gradients were observed as a basis for judging the acceptability of this type of heating system for various climates and for houses of different sizes. The observed heat loss of the test house was also compared with computed values to determine whether the capacity rating of a gravity warm air furnace should be reduced by some fixed percentage when such a furnace is located on the living level of a single story house.

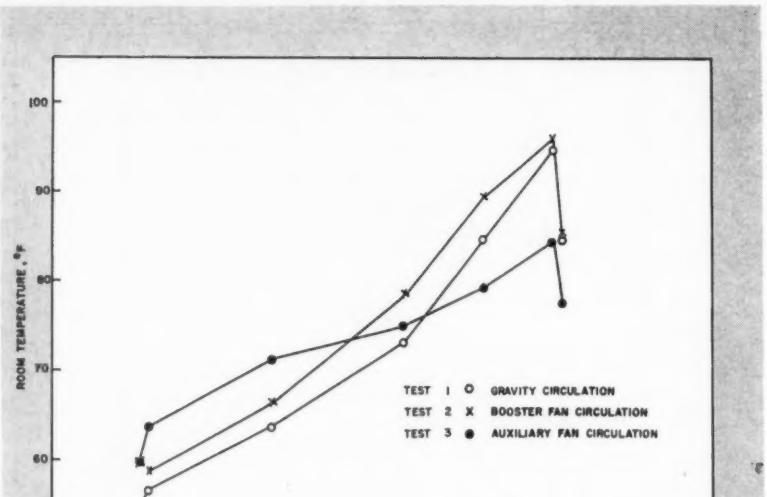


TEMPERATURE DISTRIBUTION measurements are taken by thermocouples enclosed in 3 in. cork spheres throughout the house at various levels

The results reveal that the heat loss of the structure was not significantly greater than for similar heating installations where the heating unit is entirely enclosed in the heated space. It was also found that ceiling insulation is desirable to restrict heat loss upward and to promote radiation downward from the warm ceiling surface.

### 'Outside' Weather Can Be Regulated

The test bungalow was constructed at the National Bureau of Standards for research in heat transfer phe-




**TEMPERATURE DISTRIBUTION** and floor height comparisons in one room of the test bungalow furnished statistics used to evaluate the gravity heating system

nomena. It has four rooms, a bath, and a small central hallway. Its 616 sq ft floor area approaches the lower limit of acceptable area for detached single family dwellings. Entire heating systems can be installed in the bungalow to obtain data for estimating the performance of various heating devices in actual dwellings. The bungalow is enclosed within an insulated enclosure so the temperature outside the house can be maintained at any level that might be encountered throughout the United States.

In the investigation, the furnace was located near the center of the house. The distance from the supply grille to the most remote doorway of a connecting room was about 5 ft, and the distance to the center of the most remote room was about 11½ ft. There was no more than one doorway between the furnace and any room to be heated. Thus, the installation was favorable to good temperature distribution from the standpoint of floor area to be served, furnace location, room arrangement, and distance from the furnace to each of the connecting doorways.

### Three Rooms Heated Directly

The gravity furnace, with or without a booster fan, delivers a supply of warm air from one or more grilles whose center lines are typically 78 to 80 in. above the floor level. Since practically no duct system is generally used for this type of installation, the furnace can deliver warm air directly into only one, two or three rooms, depending on the furnace location, and there may be one or more rooms that must be warmed by air movement in both directions through doorways. In the rooms heated directly by supply grilles, the heated air warms the ceiling by conduction and convection; the ceiling, if adequately insulated, in turn radiates significant amounts of heat to the floor and walls. For example, in one test, the average ceiling surface temperature in the living room was 102 F. Previous studies of a ceiling panel heating system showed that the heat emission from the ceiling surface at that temperature was about 35 Btuh (sq ft).

Since the warmest air is near the ceiling and since the furnace delivers little warm air below the level of the tops of doorways, the air that can pass to connecting rooms through doorways is at a lower temperature and therefore conveys less heat to these rooms. Thus, there is much less radiation from the ceilings of rooms heated through connecting doorways. For example, the average ceiling temperatures of the bathroom and two bedrooms ranged from 75 to 80 F.

With gravity circulation of air through the furnace, none of the warm air is delivered directly to the lower half of the room. However, cooling of the room air at the exterior walls causes downward convection currents. The temperature of the lower part of the room is determined by the temperatures of these downward currents except when appreciable radiation occurs from the ceiling. The air circulation rate through the furnace by natural convection was between 200 and 250 cfm — probably much less than the total natural downward convection at all the exterior walls of the house. Consequently, the lower portions of the rooms could only be warmed as the downward currents of air at the exterior walls became warmer, again except for radiation effects from the ceiling.

The booster fan was installed to see if the distribution would be improved enough to produce comfortable temperatures in the rooms which were heated indirectly.

Since the booster fan increased the air circulation through the heater no more than 20 to 30 percent, it is

likely that the booster fan forced little warm air into the lower part of the room.

The temperature distribution within the test bungalow was ascertained by means of 200 thermocouples enclosed in 3 in. cork spheres located at five stations and five levels in each of the four large rooms, at three stations and five levels in the bath, at suitable stations on the floor, in the ceiling surface, on the sidewalls, in the attic, and out of doors. Parallel multiple junction thermocouples were placed at the furnace inlets and outlets. The absolute values of the heat transmitted to the attic were determined by 20 heat flow meters placed over the first layer of rock wool insulation in the attic.

After steady state conditions had been maintained in outside and inside temperatures for approximately 8 hr, test periods of about 12 hr were begun. Inside temperatures at approximately 150 stations were recorded at 4 hr intervals. Hourly recordings were made of the following temperatures: outside air, 30 in. level at five room centers, five locations on the furnace, gas supply and one location in the closet. Gas consumption, electrical energy used for lighting the house, electrical energy consumed by motors, and gas pressure were recorded hourly.

The test data does not provide specific answers to all questions that might be raised about gravity warm air heating of basementless houses. However, it does provide information on the temperature distribution produced by this type of heating system and offers some guidance in its application to small houses.

## Distribution Is a Problem at −5 F

The test results at an outdoor temperature of about −5 F show the furnace was able to produce a temperature of 70 F or higher at the 30 in. level in all rooms with either two or three supply grilles when the booster fan was in operation. With gravity circulation of the air under these conditions, the two bedrooms and bath were not heated to 70 F at the 30 in. level. However, the temperature difference between the 2 in. and 60 in. levels was about 19 deg with the booster fan in operation and 15.5 deg with gravity circulation of the air. Experience with this and other heating systems indicates that occupants begin to experience discomfort if the temperature at the 2 in. level falls below 65 F or if the temperature at the 60 in. level exceeds 80 F. By this criterion, at an outdoor temperature of −5 F, some of the rooms would be too warm at the 60 in. level with the booster fan operating; others, too cold at 2 in. level with gravity circulation.

Heating engineers commonly compute heat losses for dwellings on the basis of an indoor temperature of 70 F. However, it is generally recognized that in the United States indoor temperatures ranging up to 75 F are preferred by normally clothed adults. It is probable that at the 30 in. level a 5 deg variation in temperature between rooms would not be excessive as long as none of the temperatures was below 70 F or above 75 F and provided the vertical temperature differences in the living zone were reasonable. By this criterion the temperature distribution attained in the test bungalow with the furnace used for this investigation would hardly be acceptable at an outdoor temperature of −5 F but would be acceptable at an outdoor temperature of 15 F.

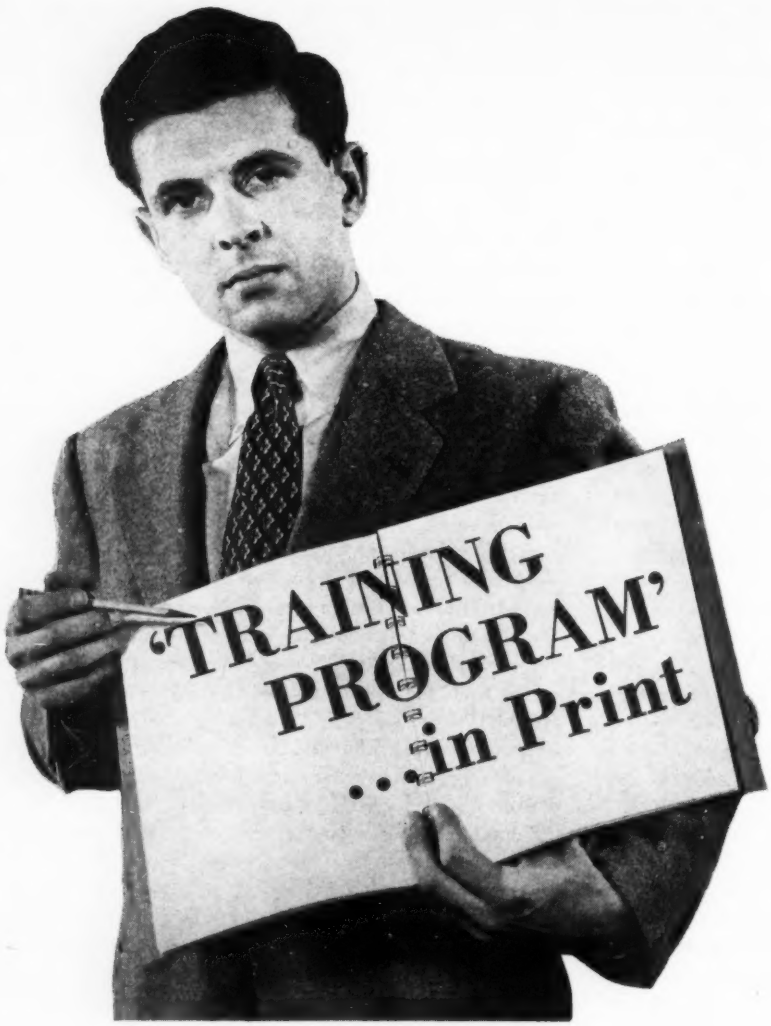
## Are Standards Too Liberal?

The results observed in the test bungalow in which the maximum distance between the furnace outlet and the center of any room did not exceed 11 ½ ft, indicate that the limit of 18 ft specified for this distance in the FHA Minimum Property Requirements Revision No. 51 is very liberal. The distance from the furnace outlet to the center of the coldest room was only 9 ft. Probably few installations would have more favorable characteristics than the test installation for good distribution of heat by this method with respect to floor area, central location of the hallway, and central location of the furnace. However, some larger houses could have a lower heat loss than the test bungalow if more insulation were used to decrease the temperature difference between levels and between rooms. The computed heat loss of the test bungalow was about 51 Btuh per sq ft of floor area for an indoor-outdoor temperature difference of 70 F.

The heat loss of the test bungalow was computed using the method described in the Guide of the American Society of Heating and Air-Conditioning Engineers. On the average, the computed heat loss values were about 5 percent higher than the observed values. In a particular installation of this type the relation between computed and observed heat loss of a house would depend on whether the thermostat was set to produce a desired temperature in the warmest room or in the coldest room since there probably would be a temperature difference between rooms. For an indoor temperature of 70 F and an outdoor temperature of −5 F at the test installation, approximately 10 percent more heat was required for the whole house when the coldest room was warmed to 70 F than when the warmest room was heated to 70 F.

## Design Temperature Should Be Above Zero

It was concluded from the investigation of the specimen furnace in the test bungalow that this type of furnace — with or without a booster fan — should be used only in areas where the winter design temperature is zero F or higher. However, application in colder climates might be satisfactory in some cases where the heat loss of the house is significantly lower than 50 Btuh per sq ft of floor area at design outdoor temperatures. This conclusion is based on observations made when the outdoor temperature was −5 F, for which: 1) the furnace was not able to produce a temperature of 70 F at the 30 in. level in the center of all the rooms without the booster fan, 2) the vertical temperature differences were as high or higher than the limit considered acceptable, and 3) the maximum temperature difference between the rooms was a little greater than 5 F at the 30 in. level and considerably greater than 5 F at other levels above the floor.




**This is the fourth in a new group of articles to appear in American Artisan under the general heading "'Training Program' . . . in Print." These articles are especially prepared to aid dealers in developing "know how" in all phases of their organizations. Previous articles have dealt with electrical circuits from a dealer's engineering standpoint, and with a phase of business management which emphasizes a close control over all aspects of the business. This month we again turn to a pressing electrical problem as it affects the air conditioning dealer.**

# Power Factor — What's That?

**Here's a term air conditioning dealers will encounter more and more frequently in their closer relationship with electrical problems. Essentially, it involves the amount of current required to deliver specified horsepower. This discussion testifies to the importance of acquiring a working knowledge of the term**

**By Lee Wilcoxon**

A DEALER WHO had been plagued by a series of blown fuses in a separate circuit which served a window air conditioner in a customer's home finally turned to an electrical engineer friend for help. After a few routine checks the engineer identified the trouble as a low power factor in the unit's motor.

And therein lies a story which air conditioning dealers will need to know in this age of power problems associated with the rise of residential air conditioning.

This particular case began with the dealer's sale of a window unit

which he plugged into a new outlet especially installed for the air conditioner. The unit would run a few hours, then blow its fuse, which was rated to be adequate for the ¾ ton unit. However, the engineer's suggestion following his diagnosis of the trouble was to install a larger fuse.

### Larger Fuse Is Justified

This suggestion drew immediate protest from the dealer whose first lesson in working with electricity had been a caution against overfusing. He was reassured by the engineer, who explained, "Since this unit is on a circuit by itself, and the wire is No. 12, the larger fuse is justified. But that does not mean all such troubles could be cleared up so easily."

Convinced that the larger fuse would not cause a conflagration, the dealer returned to the engineer's reference to the power factor of the motor, requesting a definition of the term.

### Power Factor Explained

The engineer hesitated before answering. "That is one of the toughest questions you could ask. Every electrical engineer knows the answer, but few can explain it satisfactorily to anyone else." He paused, then continued, "The least technical explanation is to say that power factor represents the ratio between apparent power and real power. Technically, power factor is equal to the cosine of the phase angle between the voltage and current in a circuit. But I think I can give you a pretty good idea without getting unnecessarily technical. Do you know what we mean by voltage — the technical definition?"

"I think so. It's the electrical pressure which causes current to flow through a wire."

"Good. And do you know what we mean by current?"

"As I understand it, current in amperes indicates the rate at which electricity flows. I think of it as being something like water flowing through a pipe, or gas through a tubing."

"That's close. Electrical current is often compared with water flowing through a pipe, and voltage with the pressure that causes water to flow. Now, do you know what is meant by electrical power?"

"That's something to do with watts, isn't it?"

"Yes. A watt is the unit used to measure electrical power. But do you know what is meant by the term electrical power?"

### Resistance Generates Power

"I know that when voltage forces current through a resistance it results in electrical power being used. I can't say I know exactly what is happening."

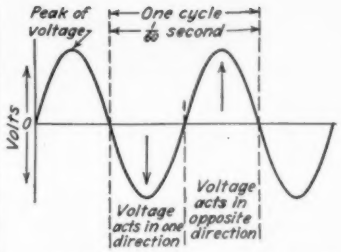
"You have the right idea. Whenever electrical energy is converted into mechanical power, or into heat, electrical power is involved. Probably the best example is that represented by an ordinary but familiar incandescent lamp. The glowing element within a lamp is a thin tungsten wire which has high resistance; it presents considerable opposition to the flow of electrical current.

"Current flows only when sufficient voltage is pressing it. Voltage forces current through the filament, overcoming the resistance. But in so doing it causes the wire to heat, to the point of incandescence. More than that, during the process a drop in the voltage occurs. Electrical power is used whenever voltage forces current through a resistance."

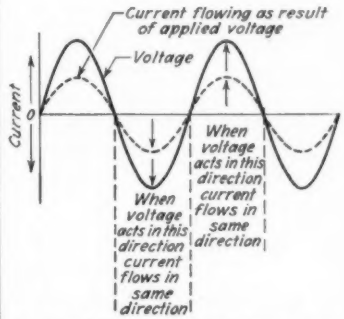
The engineer elaborated, "The amount of electrical power used by the lamp is equal to the voltage across the lamp multiplied by the current through it. For example when 120 volts force 2 amp of current through the filament it uses 240 watts of electrical power."

The dealer brightened. "That's what is meant by the volts and watts marked on a lamp, then. But what does that have to do with power factor?"

"I want to review these simple electrical principles before getting into power factor," the engineer cautioned. "With the lamp we are dealing with simple resistance. So long as voltage forces current through simple resistance, the voltage and current are in phase with each other."




**1** VOLTAGE IN a-c circuit rises and falls to complete a cycle 60 times a second


Current flowing as result of applied voltage
Voltage
Current
0
When voltage acts in this direction current flows in same direction
When voltage acts in this direction current flows in same direction

**2** CURRENT WHICH flows as a result of alternating voltage normally is in step with the voltage

### Engineer Defines Phase

"What do you mean by being in phase?"

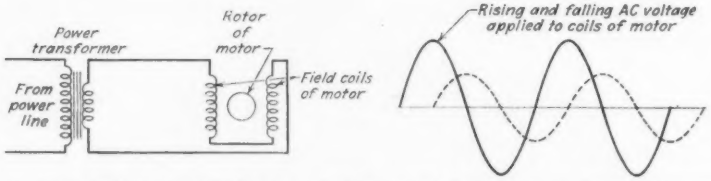
"When speaking of phase we always refer to alternating current. That, of course, is the most common kind. It normally reverses its direction of flow 120 times a second, going through 60 complete cycles each second."

"Yes, I understand that. Our motors operate on 60 cycle a-c."

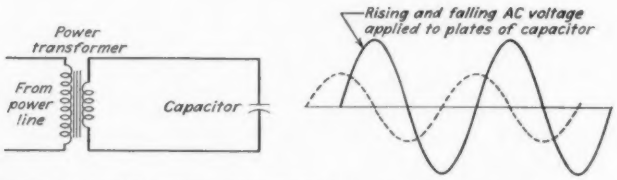
"That's right. But to go on, the voltage rises, reaches its peak, decreases, goes to zero, reverses, then flows in the opposite direction. It does all that 60 times each second. When that voltage is applied to the filament of a lamp the current rises at the same time the voltage rises, declines at the same time, and reverses during the same instants of time the voltage reverses. When they rise and fall in step with each other we say they are in phase."

Step-down power transformer
From high tension distribution line
Secondary distribution circuit
Lamp
Rising and falling AC voltage applied to lamp
Rising and falling AC current through lamp

**3** WHEN A RESISTIVE LOAD such as that represented by an incandescent lamp, is placed across an a-c line the current remains in phase with voltage


Power transformer
From power line
Rotor of motor
Field coils of motor
Rising and falling AC voltage applied to coils of motor

**4** LOW POWER FACTOR is caused when an a-c voltage is connected across the coils of a motor and the current is thrown out of phase with voltage




**5** WHEN ALTERNATING CURRENT passes through a capacitor the current is thrown out of phase with the voltage. Here the phase difference is in the opposite direction from that of a motor

"Isn't that always the case?"

"No. Voltage and current are in phase with each other only when the voltage is applied to a resistance. There is other opposition to current which changes this situation so the current and voltage are no longer in phase."

"Isn't all opposition to current flow called resistance?" the dealer queried.

### Reactance Enters Picture

"No. A length of straight wire has inherent opposition called resistance. Take that same length of wire and wind it in the form of a coil, especially if wound on an iron core, and the wire develops a new type of opposition entirely aside from, and different from, its original resistance. We call it reactance. Actually, there are two kinds of reactance. That caused by a coil is called inductive reactance. Inductive reactance is caused by magnetism which surrounds a wire carrying current. The important thing is that reactance opposes flow of alternating current, but does not oppose it exactly the same as resistance. Nor does it have any significant effect on direct current."

"What's the difference between the opposition of reactance and that of resistance?"

"Inductive reactance causes current to lag a little behind the voltage. Instead of rising and falling in step with the voltage, it rises and falls an instant later. In plain words, the current is out of step with the voltage. We say it lags the voltage.

"As we said, when a-c voltage forces current through a resistance, such as a lamp filament, power used is equal to voltage multiplied by the current. This is exactly the same as though it was direct current from a battery.

"When a-c voltage is applied to resistance the power factor is 100 percent. Just like d-c. But when a-c voltage forces current through a coil it meets other opposition in addition to resistance. It encounters reactance. Both these factors now act to oppose the current."

"That sounds reasonable enough," the dealer said. "But I don't see why you are making such a distinction between resistance and reactance. Apparently, both oppose the flow of current."

### Current Lags Voltage

"True. But presence of reactance causes current to lag the voltage. Voltage and current no longer reach their peaks at the same time; they are no longer in phase. This being so, it is no longer possible to simply multiply the voltage by the current to see how much power is being used.

"When the voltage and current are out of phase the voltage must force more current through the coil of wire to develop the same amount of power."

The dealer saw the light. "Are you saying a low power factor motor requires more current to deliver the same horsepower as a motor with a high power factor?"

"Essentially, that is true," the engineer agreed.

"Then when you said that the air conditioner had a low power factor, you meant it drew more current through the fuses to deliver the necessary horsepower?"

"That is correct. The farther the current is out of phase with the voltage the more current is needed to do a given amount of work. Also, the farther the voltage is out of step with the current the lower is the power factor."

### Fuse May Be Inadequate

"Then, a 15 amp fuse is not always large enough to carry the current to a ¾ ton air conditioner, assuming the ¾ ton unit uses a ¾ hp motor?"

"Right. If the power factor is low enough, and the motor draws enough current, a fuse will blow."

"Why then, did it sometimes take

the air conditioner so long to blow a fuse?"

"The answer to that is one reason why power companies hate low power factor loads. They not only overload their own circuits, they also set up undesirable conditions which affect other electrical consumers. The motor of your customer's unit normally draws more current than a high power factor motor of the same hp rating. Probably close to the limit of the fuse. Even so, the fuse could have carried that load indefinitely. But somewhere on the same power line secondary, either in the same house or one nearby, is another low power factor motor. Maybe a refrigerator, freezer or another air conditioner. Probably two or more."

"But if they are not on the same circuit how does that affect the fuse to the air conditioner?"

"When the other motor began operating it caused the power factor in the power line secondary to drop still lower. That in turn caused the air conditioner motor to draw still more current. Then the fuse blew."

"You mean that another motor. not on the same fused circuit, could cause the air conditioner motor to draw more current than normal?"

"Yes. Even if in another building, so long as it is on the same power line secondary."

"What do you mean by power line secondary?"

"Power companies distribute electricity at high voltages. Near where the power is used they step down the voltage so it can be used in a home. Usually several homes or entire neighborhoods are served by the same secondary."

### Other Users Are Affected

"You mean, then, that low power factor in one home affects other users from the same power line?"

"Yes If several customers have low power factor machines the company soon finds its lines overloaded with current that is doing nobody any good. It is called wattless power because it does not register on their meters, but it does overheat their lines."

"How does it happen we seldom hear of power factor?" the dealer asked.

"Maybe you never heard of it, but I can assure you it is not new. Industrial users have worried about it for years. But it has never been a problem among small users because in the past their biggest load was lighting, which has a very high power factor."

### Power Factor Being Studied

The engineer could have added that low power factor in window air conditioners has been receiving serious study by power company managements. Small air conditioners began selling strongly in 1950. By 1953 about 800,000 a year were added to circuits. This year an estimated 1.2 million were sold. This has been upsetting existing patterns of electrical distribution.

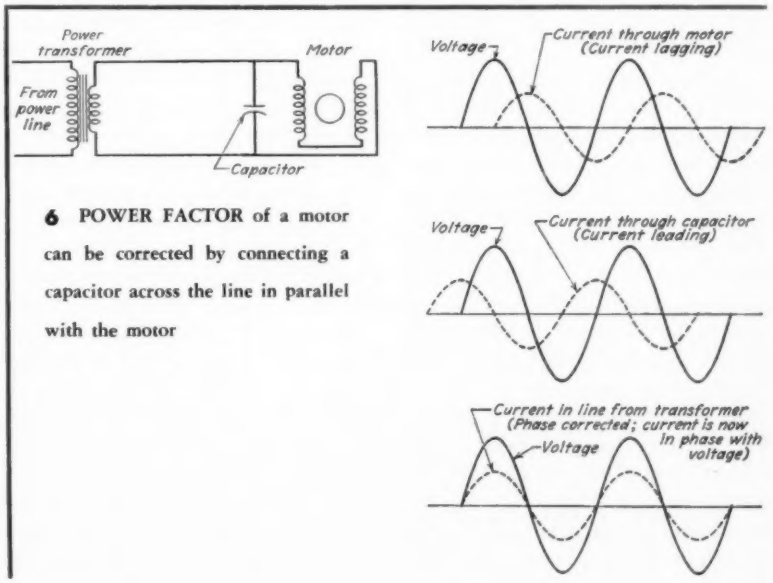
Current they drew soon imposed a heavy load on power lines. That load was complicated by the low power factor of some of the motors.

Power companies try to maintain power factor in their distribution lines at 90 percent or higher. So long as the principal load of small consumers was resistive, and industrial users corrected their own power factor, the power factor could be maintained at that level.

Power factors of motors vary widely. Some have a power factor as low as 40 percent. Such motors draw more than twice the current needed by one with a high power factor. Others have power factors of 95 percent and higher.

Early in 1954 major power companies studied the desirability of establishing a specific minimum power factor requirement for room air conditioners. The figure most generally considered was 90 percent.

The Edison Electric Institute, representing private power companies, went on record as recommending that all room air conditioners be required to have 90 percent power factor. This alarmed manufacturers, since it would increase their costs. Most compressor and fan motors then used had low power factors.




**6** POWER FACTOR of a motor can be corrected by connecting a capacitor across the line in parallel with the motor

**"Investigate the power factor of your own units before you find yourself in the uncomfortable position of having on hand a stock of obsolete units which the power company will not let you connect to its lines."**

Power factor could be raised in either of two ways, but both increased their cost. It was recognized the motors would have to be redesigned, so the problem was tossed back to the motor manufacturers.

Seriousness of the situation is emphasized by a survey made in 1952 by EEI engineers. It covered units built by all manufacturers. It found that power factors of room air conditioners ranged from 60 to 80 percent.

This was extremely low, but the number of units in use was still so low no serious trouble developed. But the power companies were looking ahead.

### Manufacturers Are Cooperating

Another survey in 1953 found power factors a little higher, but still lower than desirable. Those then being sold had power factors between 65 and 83 percent, with the majority between 70 and 75 percent. Power factor of 1954 models ranged between 70 and 82 percent.

These figures show manufacturers were improving power factor of their motors, but power companies still wanted 90 percent.

An agreement worked out between EEI and manufacturers of air conditioners set up standards for 1956 air conditioners. It was agreed that power factor on 1/3 hp units would be at least 75 percent, on ½ hp units 80 percent, and on ¾ hp and larger not less than 85 percent.

These standards, while not ideal, represented attainable goals.

At least one major motor manufacturer is now exceeding the minimums set by those agreed standards. Their 1956 model ½ hp motor has 90 percent power factor, contrasting with the agreed 80 percent minimum. None of their 1956 motors have power factor lower than 85 percent, and some have power factors as high as 91 percent.

Air conditioning dealers should be aware of these things. Since major motor manufacturers have demonstrated their abilities to build high power factor motors for small air conditioners the power companies will probably begin insisting that others conform to the same standards.

### Don't Get Stuck

It would be well for each dealer to investigate the power factor of his own units before he finds himself in the uncomfortable position of having on hand a stock of obsolete units which the power company will not permit to be connected to its lines. It is true that the power factor of such units can be corrected, but it will cut into profits. The exact manner in which power factor in individual units can be corrected is another story; one too long to discuss at this time.

Power companies can forbid connection to their lines of any device which it feels is detrimental to other customers. It has long been recognized they have the right to forbid connection of low power factor devices unless the power factor is corrected by the user. They have often exercised that right when dealing with large users of electricity. It has been only recently that they have been confronted with the possible need to apply those penalties to smaller users.

### Other Benefits Too

Entirely aside from the attitude of power companies are the benefits to a customer whose air conditioner has a high power factor. Current and power consumption is less. Current consumption of some ½ hp motors is reduced as much as 40 percent, making it possible to plug into any 15 amp circuit. Such a motor actually draws less current than an electric iron or toaster, and avoids the necessity of expensive rewiring, or need to install additional circuits.

Nor is there the heavy rush of current through the motor at the moment of starting, which so often results in sudden voltage drop and dimming of lights. There is less tendency to blow fuses, even when plugged into an ordinary lighting circuit.

**WHAT'S YOUR PROBLEM?**

**The American Artisan's 'TRAINING PROGRAM' — IN PRINT will explain the whys and wherefores of some of the dealer's problems, tell what to do about them. You will want the members of your organization to study these articles carefully, keep them for future reference . . . . If you have a problem you'd like to see covered, write Clyde M. Barnes, Editor, American Artisan, 6 N. Michigan Ave., Chicago 2, Ill.**

# *Developing a Pattern for an*
# Exhaust Stack Weather Cap

**. . . for a forced air system outlet stack, where velocity pressure losses are important to system performance**

THE PRIMARY PURPOSE of a weather stack cap is to keep rain and snow from pouring into an exhaust system discharge opening when the system is not in operation. The difference in design between a gravity stack cap and an exhaust stack cap is the difference in air pressure requirements. When air is being discharged by natural draft, a single cone is all that is required. However, if air is under pressure in the stack, the single cap would become an air pocket which would develop a back pressure; the double cone removes this air pocket and directs the air around the perimeter of the stack to the outside atmosphere. When an exhaust cap is used on a forced air system outlet stack, consideration must be given to velocity pressure loss. Fig. 1 gives the loss in relation to the distance the cap is located above the top of the stack.

The following is a step by step solution to the pattern problem.

**Simplified Method Drawing, Fig. 2 —**

*a*) Draw the 1 in. horizontal line marked DE. From points D and E draw lines perpendicular to line DE. Measure up 1½ in. on these lines and mark the points F and G. Draw a line connecting points F and G. Bisect line DE and draw the vertical center line CL.

*b*) From line FG, measure up ⅝ in. and draw a line perpendicular to and extending on both sides of the center line; mark the line HJ. Where the center line and line HJ intersect, mark the point M. From points H and J draw lines at 30 deg to line HJ to intersect the center line above line HJ. Mark the point R.

*c*) From points H and J measure ⅛ in. toward the center line and establish points L and K. Draw the hidden edge line LK. From points L and K, draw lines at 22½ deg to line LK to intersect the center line below line HJ. Mark the point O.

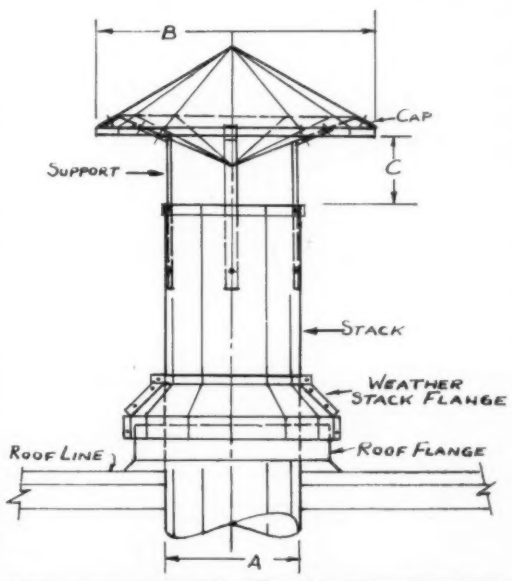
*d*) With point H as center and radius HM, draw an arc upward to intersect the line HR at N. Mark the distance from N to R with the letter A.

*e*) With point L as center and radius ⅞ in., draw an arc down to intersect line LO; mark the intersection P. Mark the distance from P to O with the letter E.

*f*) Draw the band iron cap supports as shown and mark the holes to suit. Mark the distance from point O to each hole with the letters RF and RG.

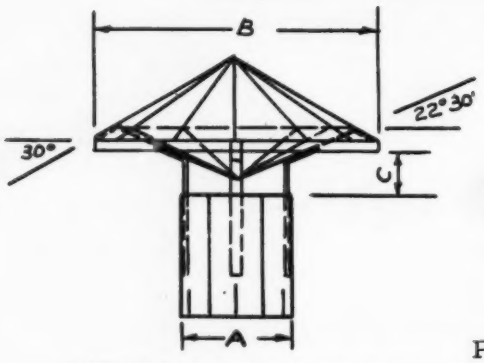
**Top Cap Pattern, Fig. 3 —**

*a*) Draw a horizontal center line and establish point R′. Working from Fig. 2, measure with a compass the



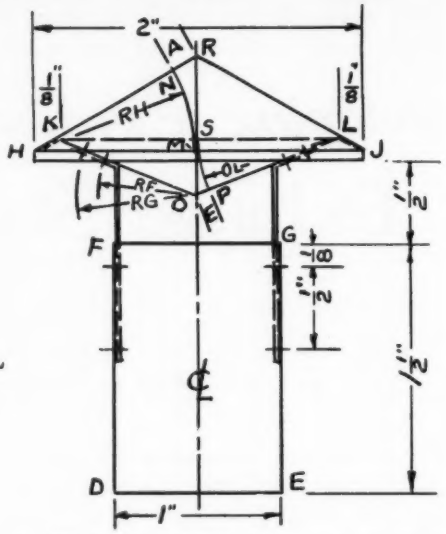

| C=No. of Diameters | Loss Fraction of Vp |
|---|---|
| 1.0 diameter | 0.1 |
| 0.75 diameter | 0.18 |
| 0.60 diameter | 0.41 |
| 0.50 diameter | 0.73 |

**1** WEATHER CAP DESIGN identifies details of fitting; table gives loss in relation to height of cap above top of stack

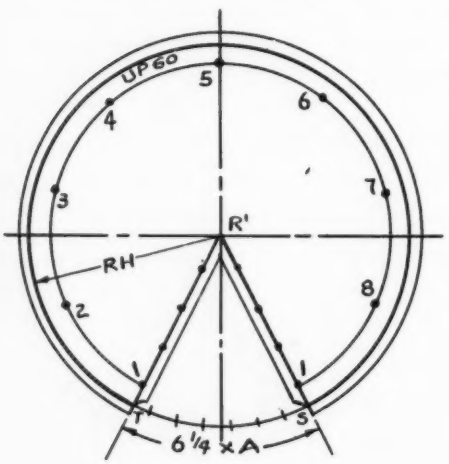


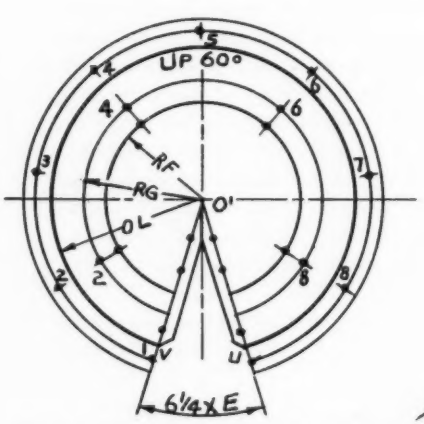

DETAILS and dimensions:
A=Stack diameter
B=Stack diameter X 2
C=Stack diameter/2

PICTORIAL DRAWING

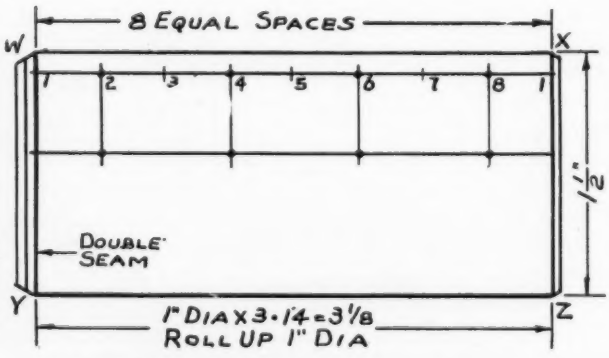



2 FRONT VIEW of weather cap



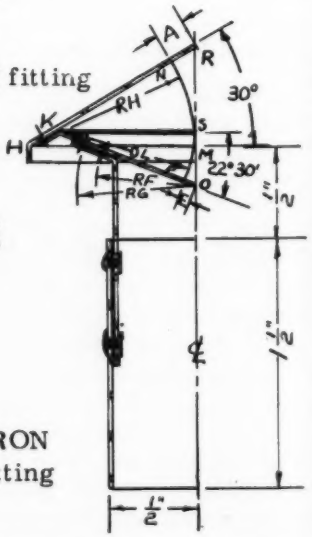




3 TOP CAP pattern and... 4 BOTTOM CAP pattern of fitting




5 PIPE PATTERN with length and circumference dimensions

6 BAND IRON support fitting




CUTAWAY VIEW of simplified method drawing

30 deg line length marked RH, and with point R′ (Fig. 3) as center, draw a circle.

*b*) Draw the work line R′S. (This line can be drawn from point R′ to any point on the circumference line.) From Fig. 2, measure with a compass the difference in length of the cap radius line HM and the cap 30 deg pitch line HR, which is the distance indicated by the letter A. Working from point S on the circumference line (Fig. 3) measure a distance equal to 6¼ × length A, and mark the point T. Draw the line R′T.

*c*) Working from lines R′S and R′T, measure to the right of line R′T and to the left of line R′S a distance equal to the required seam width and draw the seam lines.

*d*) From the circumference line, measure out the given width of the flange which is ⅛ in., and draw the flange circumference line. Note: The 6¼ × lengths A and E are derived from the formula radius × 6.28 = circumference of a circle. To calculate the cutout section of the 30 deg top cone, the formula (radius RH × 6.28) − (radius MH × 6.28) would equal the length of the arc to be cut out. By finding the difference in length of line MH and RH and assuming that 6.28 = 6¼, then the length marked A measured six times plus ¼ of A will be a close approximate of the cutout section. This method will eliminate a mathematics problem.

**The Bottom Cap Pattern, Fig. 4 —**

*a*) On a horizontal center line, establish point O′.

*b*) Working from Fig. 2, measure with a compass the 22½ deg line OL. With point O′ (Fig. 4) as center and radius OL, draw a circle.

*c*) From point O′, draw the work line O′U. (This point can be drawn from point O′ to any point on the circumference line.) From Fig. 2, measure with a compass the difference in length of the cap radius line LS and the cap 22½ deg pitch line LO, which is the distance indicated by the letter E. Working from point U on the circumference line (Fig. 4) measure a distance equal to 6¼ × length E and mark the point V. Draw the line O′V.

*d*) Working from lines O′U and O′V, measure to the right and to the left of these lines a distance equal to the required seam width, and draw the seam lines.

*e*) From the circumference line drawn about radius OL, add the required flange width LJ as shown on Fig. 2. With point O′ (Fig. 4) as center, draw a long arc to intersect lines O′V and O′U. Find the center of the flange width and with point O′ as center, draw the center flange line; on this line mark off 8 equal divisions for rivet hole location.

*f*) With a compass, measure the radius from point O′ to the center flange line. Return to Fig. 3 and with this radius and point R′ as center, draw a long arc to intersect lines R′S and R′T. On this line mark off 8 equal spaces and mark the location of the rivet holes.

*g*) From Fig. 2, measure radii RF and RG, which provides the locations of the bolt holes for the cap supports, and with point O′ (Fig. 4) as center, draw long arcs to intersect lines O′V and O′U. Divide arc RG into 8 equal spaces and draw lines from O′ through points 2, 4, 6, and 8. Locate the bolt holes for the cap supports at the intersection points of the lines and arcs RF and RG.

**The Pipe Pattern, Fig. 5 —**

*a*) Calculate the pipe circumference by multiplying the given diameter by the constant 3.14. Thus: 3.14 × 1 in. = 3⅛ in.

*b*) Draw the rectangle W X Y Z equal to the pipe circumference by the given pipe length, 3⅛ × 1½ in.

*c*) From Fig. 2, transfer the given lengths ⅛ in. and ½ in. to the corresponding locations on the pipe pattern (Fig. 5) and draw lines parallel to line WX. Divide the lines into eight equal spaces. Through points 2, 4, 6, and 8 draw lines parallel to line WY and locate the required bolt holes.

The band iron support length and hole location (Fig. 6) is measured from the simplified drawing (Fig. 2).

Add allowances for seams and joints and mark the patterns for fabrication.

# Seven Steps to Greater Profits

A FEW OF THE THINGS that can have an important effect on a dealer's net profit in a competitive market were recently outlined by Andrew F. Ward, packaged products sales manager, Worthington Corp., to a group of midwestern dealers in Chicago. Mr. Ward said that the dealer with the answers to the following questions would find more money going into his pocket.

1) Do you know accurately what it costs to open your front door every morning? What volume do you have to take in each month before your books begin to show a profit?

2) Have you made up a 1956 budget to determine the minimum organization you require to handle the volume you expect?

3) Are you using an accurate job record system? Do you know at the end of each installation how much money you made?

4) Do you maintain a running inventory of all equipment and material? Do you personally spot check the inventory record?

5) Do you keep service parts and expensive small items such as controls, under a signed receipt inventory control system?

6) Do you have any new equipment that has been "cannibalized" to get repair parts? (Any such equipment represents completely frozen working capital.)

7) Do you have any out-of-date equipment in inventory? The priniciple of merchandising used in department stores applies equally well to your business: "Sell it —mark it down or give the stuff away—but move it."

# What Are 'Reasonable Salaries for Officers'?

**A report from Charles H. DeLaughter, chairman of the SMCNA cost and estimating committee, sheet metal contractor and certified public accountant, emphasizes the need for consideration of problems peculiar to our industry**

QUESTIONS ON BUSINESS management are often brought out in committee meetings and it is the duty of the committee chairman to find out the answers to problems that are more involved than time will permit to obtain the answer required. Recently this question was asked:

"What is considered as reasonable for officers' salaries as referred to in the federal tax laws?" This question, raised at a recent meeting, was brought on by a case being considered in a federal tax examination of a firm doing $1,000,000 to $1,500,000 sales annually.

The information provided lacked some details, but certain suggestions can be made as follows:

### Salary Question Is Complicated

The question of "reasonable salaries" in the sheet metal industry is complicated by the fact that the sheet metal industry is not exactly like most other segments of the construction trades.

The particular concern involved is an incorporated firm.

In passing, it might be noted that so far as the Cost and Estimating committee knows, a majority of the firms in the sheet metal industry are either individual proprietorships or partnerships, with a minority of the firms incorporated. One reason for this assumption may be that companies in the sheet metal industry are commonly built up through personal service, personal ability, personal training, and personal contact with customers.

This means it is difficult to correctly evaluate any one person's efforts, training or knowledge as compared to those of another person in any other line of business.

### Executive Salaries Vary With Business

So far as the Cost and Estimating committee can ascertain, executive salaries in this industry vary widely. In an individual proprietorship, the owner generally does most of the executive work. This is also largely true of partnerships. In a number of partnerships one of the partners may do the estimating, be the salesman and manage the office; while the other acts as superintendent, or shop superintendent, or engineer, and runs the jobs.

When other personnel are employed for any one of these activities, they are generally paid rather nominal salaries and often times have the opportunity to share in the profits of the firm, or to benefit from a bonus arrangement. Such profit sharing or bonus arrangements are usually paid at the end of a calendar of fiscal accounting period.

### Bonus System Used Widely

In incorporated firms it seems to be the general rule to pay high salaries to the executives who are producing and then, through the use of a bonus system, to increase that salary at the end of the accounting period to an amount which will be in keeping with the amount of work done, the profit earned, the performance of the individual, etc. Then, as in the individual proprietorship or partnership, consideration is given key personnel, job superintendents and other employed help.

As a result of information gathered, the Cost and Estimating committee of SMCNA believes that any salary, regardless of the amount, paid to executive or key personnel would not be excessive, providing the profits of the company resulted from their personal efforts. In a firm doing $1.5 million annual volume, a salary of $45,000 per year would be only 3 percent of the gross sales and should not be considered excessive.

Realizing that Internal Revenue agents have little interest in the effort put forth or the number of hours spent in running such a business, or the risk that men take in this type of business, many firms have set up profit sharing agreements (written beforehand) to cover situations where good profits are made and then have set up only nominal salaries to executive and key personnel.

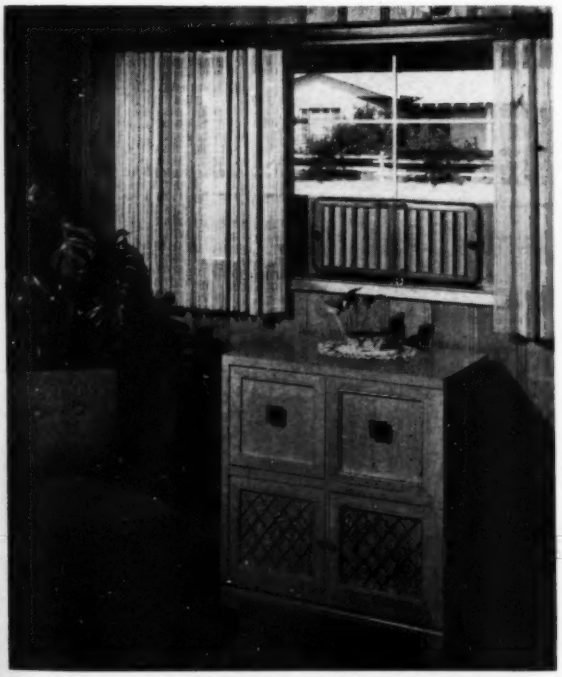
### A Suggestion Is Offered

The Cost and Estimating committee might make the suggestion that when it is necessary to present a case to the Tax Court of the United States, the sheet metal firm involved should secure the testimony of as many customers of the firm as possible, to show individual contacts and the value of individual contacts toward the production of business and subsequent profits to the firm. Testimony of contractors who have done business with the sheet metal concern cannot be overcome by the government and even if the case is lost in the tax court, there is still a good case in the appellate court.

# Evaporative Cooler Can Fit in Year 'Round Comfort Picture

***. . . using a common duct system, if the proper equipment is applied and the system is designed carefully***

**By R. S. Ash**
**International Metal Products Co.**



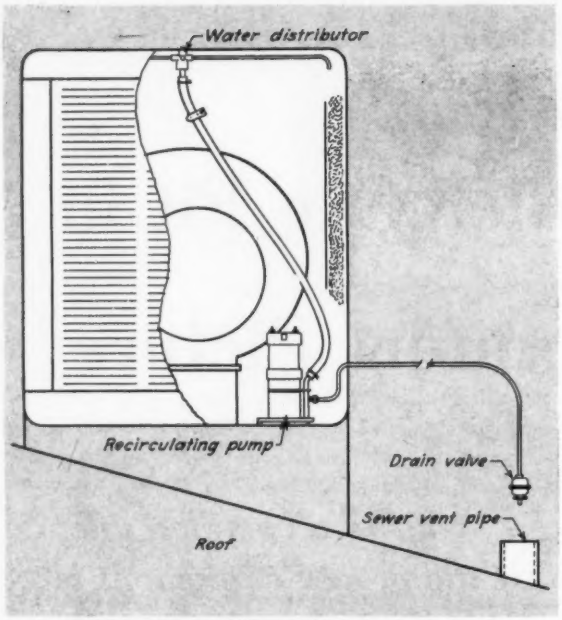
**NEW GRILLE DESIGN** makes it possible for the modern evaporative cooler to fit into any decorating scheme

THE QUESTION is sometimes asked whether evaporative cooling can be combined with forced air heating. The two may be combined with a common duct system; however, care must be exercised in designing systems of this type. Since the evaporative cooler usually handles at least five times as much air as is required on the heating cycle, the ducts and registers must be sized to fit the cooling requirements. This, of course, results in low register velocities on the heating cycle.

There are registers available with blades so arranged that the full capacity of the register may be used for cooling while only half or a third of the register is used for heating. The left half of the register adjusts from the left towards the center and the right half adjusts from the right towards the center; each half can be opened or closed independently. During the heating season when the air delivery is reduced, the design velocity and throw can be maintained by closing one section of the louvers. In this connection, registers for evaporative cooling systems should have the blades set on at least ½ in. centers and preferably 1 in. centers to minimize frictional resistance. It is also advisable to use the double deflection type for good air distribution in the space being cooled.

### Isolate the Cooler

The use of combination systems has also been held back by the fear that the cool moist air from the evaporative cooler will corrode the heat exchange ele-




**1 BLEED OFF CONNECTION** from circulating pump makes it possible to maintain mineral concentration of the sump water below critical corrosion point

ment of the furnace unless it is made of stainless steel, is porcelain enameled or otherwise protected. This problem can be overcome by isolating the cooler from the furnace in the system. Manual slide dampers or motor operated dampers should be installed in the trunk duct at the cooler outlet and at the furnace plenum. During the summer, the furnace damper is closed and the cooler damper is opened. In winter the damper positions are reversed.

Probably no aspect of evaporative cooling is less understood than the proper application of temperature and humidity controls. Although the majority of the installations are operated with manual controls, there are evaporative cooling systems complete with thermostat, humidistat, solenoid valve and control panel often costing as much as the evaporative cooler. There is a place for controls; the question is in how they should be applied.

## Coolers Are Self-Regulating

In unfolding the subject of controls for coolers, it must be remembered that evaporative cooling systems differ from other types of heating and cooling jobs in that they are largely self-regulating. Since the lowest possible temperature that can result is several degrees above the prevailing WB temperature, it is impossible to undercool to the degree that can take place with other types of equipment. The first step in providing better regulation of an evaporative cooling system is installation of a two-speed motor so the cooler can be operated on high speed during the heat of the day and on low speed during the evening and night when the cooling load is less and quiet operation is especially desirable. Two-speed coolers are generally inexpensive, usually costing the user only a few dollars more than a cooler with a single speed motor.

A second step would be to furnish a room thermostat to start the cooler automatically in the morning and turn it off at night.

## When Is Humidistat Called For?

In general, there should be little need for a humidistat since the effective temperature will always be lower regardless of the outside relative humidity if the evaporative media is left wet. There are cases, however, involving certain industrial processes, where the relative humidity must be limited. Although it is not noticeable at less than 70 percent, the humidity threshold for certain materials is in the 70 to 80 percent range. For processes such as printing and precision tool manufacturing that must be protected from humidities above some predetermined level of about 75 percent, it would be advisable to install a humidistat alone or in series with the room thermostat to turn off the entire system on the occasional day when the humidity reached the predetermined point.

## Simplicity Doesn't Eliminate Maintenance

Due to the basic simplicity of evaporative cooling systems there has been a tendency to overlook operation and maintenance. All mechanical equipment requires adjusting when it is put in operation and evaporative coolers are no exception. When the system is first installed, the air distribution system should be balanced to produce a uniform flow of cool air from each outlet. A vane type anemometer or velometer may be used to check the air delivery of each register so the dampers in the system can be set to balance the system. At the same time, the motor drive pulley should be adjusted to provide enough blower speed to deliver the required cfm. Since the cooler manufacturer has no way of knowing the static resistance the cooler will operate against, a variable pitch motor drive pulley is customarily provided .

Since the brake horsepower requirements of a blower running at a given speed will be less when operating against the static pressure of a duct system than at free air delivery, the blower speed should be increased to deliver the capacity required for the heat load. Adjustment of the blower speed should not be a guessing matter. Such a practice often results in overloading the motor and causing it to fail. The power input to the motor should be checked with an ammeter as the pulley ratio is varied until the amperage draw of the motor is equal to or below the name plate rating.

## Provide for Bleedoff Connection

Recently it has become a common practice to install evaporative cooling systems with recirculating pumps to

(*Continued on page* 82)

# WHY THE Wm. F. Zeller Co., Inc., SHEET METAL CONTRACTOR OF BALTIMORE, MD., HAS USED Revere Sheet Copper EXCLUSIVELY for 50 YEARS!

The Wm. F. Zeller Co., Inc. has been doing business in the same location for over 50 years. During that time it has built up an enviable reputation for its fine artistry and quality workmanship in the erection of many noted Baltimore landmarks.

When asked why his firm gets all of its sheet copper from Revere, Earl Zeller, President, said, "There are four reasons.—First, we have found over the years that we can always rely on the fine quality and uniform gauge of the sheets ordered. Second, the good delivery service. Third, the name Revere is so widely known and accepted that it adds prestige to our operation, and fourth, Revere's Technical Advisors. They are a great help when we are planning many of our more difficult jobs. Many a time their suggestions have resulted not only in our saving time and material, but in a more efficient installation as well.

"Even when copper was in short supply some years back we preferred to go along with Revere rather than change our source of supply, and believe me it paid off, because we've never had a complaint about materials.

"And as far as copper itself is concerned we prefer it to any other metal to work with. It is easy to solder, shape and cut. And as every sheet metal man knows, copper is the only metal to use on buildings that are built to last."

Guard *your* reputation...keep out of trouble...insist on enduring, non-rusting Revere Copper of uniform quality. And if you have problems regarding the application of Revere Copper, get in touch with our Technical Advisory Service. It is backed by more than a century and a half of experience in working with sheet copper.

**WING OF ST. MARY'S SEMINARY,** Baltimore, Md., where the WM. F. ZELLER CO., INC. recently installed some 17,000 lbs. of Revere Leadtex 16 and 20 oz. copper in the form of flashing, gutters and leaders. Revere Distributors: CLENDENIN BROS., General Contractor: THE E. EYRING & SONS COMPANY; both of Baltimore. Architects: MAGINNIS and WALSH and KENNEDY, Boston. It is one of the hundreds of buildings on which the Zeller Co. has installed Revere Copper during its more than 50 years in business.

**REVERE**

**COPPER AND BRASS INCORPORATED**

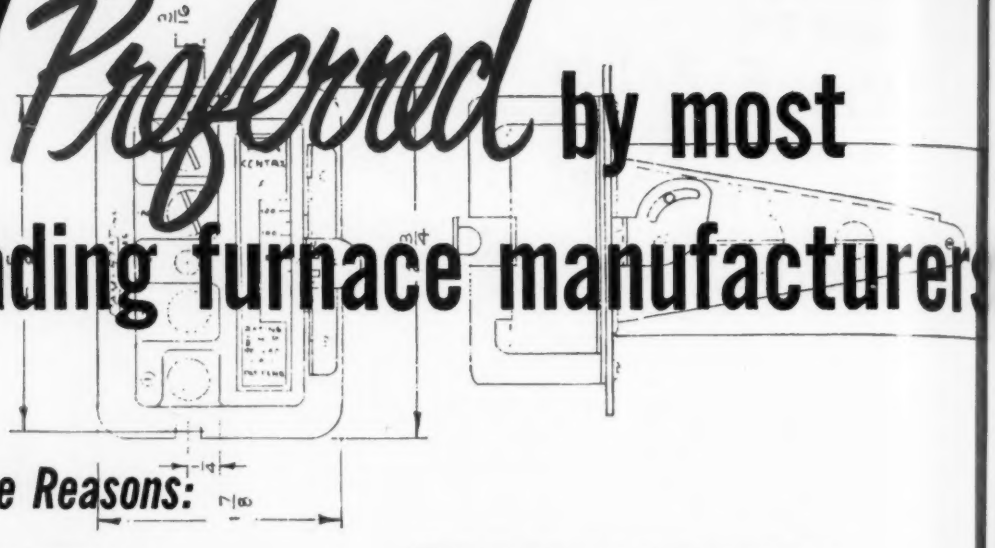
*Founded by Paul Revere in 1801*

230 Park Avenue, New York 17, N. Y.

*Mills: Baltimore, Md.; Chicago and Clinton, Ill.; Detroit, Mich.; Los Angeles and Riverside, Calif.; New Bedford, Mass.; Rome, N. Y.*
*Sales Offices in Principal Cities, Distributors Everywhere.*

*(From top to bottom):* John H. Gunther, Exec. V. P.; Harry C. Guenther, Sec. and Treas.; Earl E. Zeller, President.

# *Now! Preferred* by most leading furnace manufacturers



## *Here Are The Reasons:*

- TWO YEAR GUARANTEE
- SIXTY DIFFERENT COMBINATIONS
- AVAILABLE FOR INTEGRAL OR PLENUM MOUNTINGS
- WITH OR WITHOUT CONDUIT HOUSINGS
- INDIVIDUAL CONTROLS OR IN COMBINATION
- WIDE VARIETY OF SETTINGS AND DIFFERENTIALS, BOTH FIXED & ADJUSTABLE
- AVAILABLE WITH 7" OR 3" BIMETAL ELEMENT EXTENSION
- PRECISION CALIBRATIONS AND DIFFERENTIALS —ACCURATELY MAINTAINED
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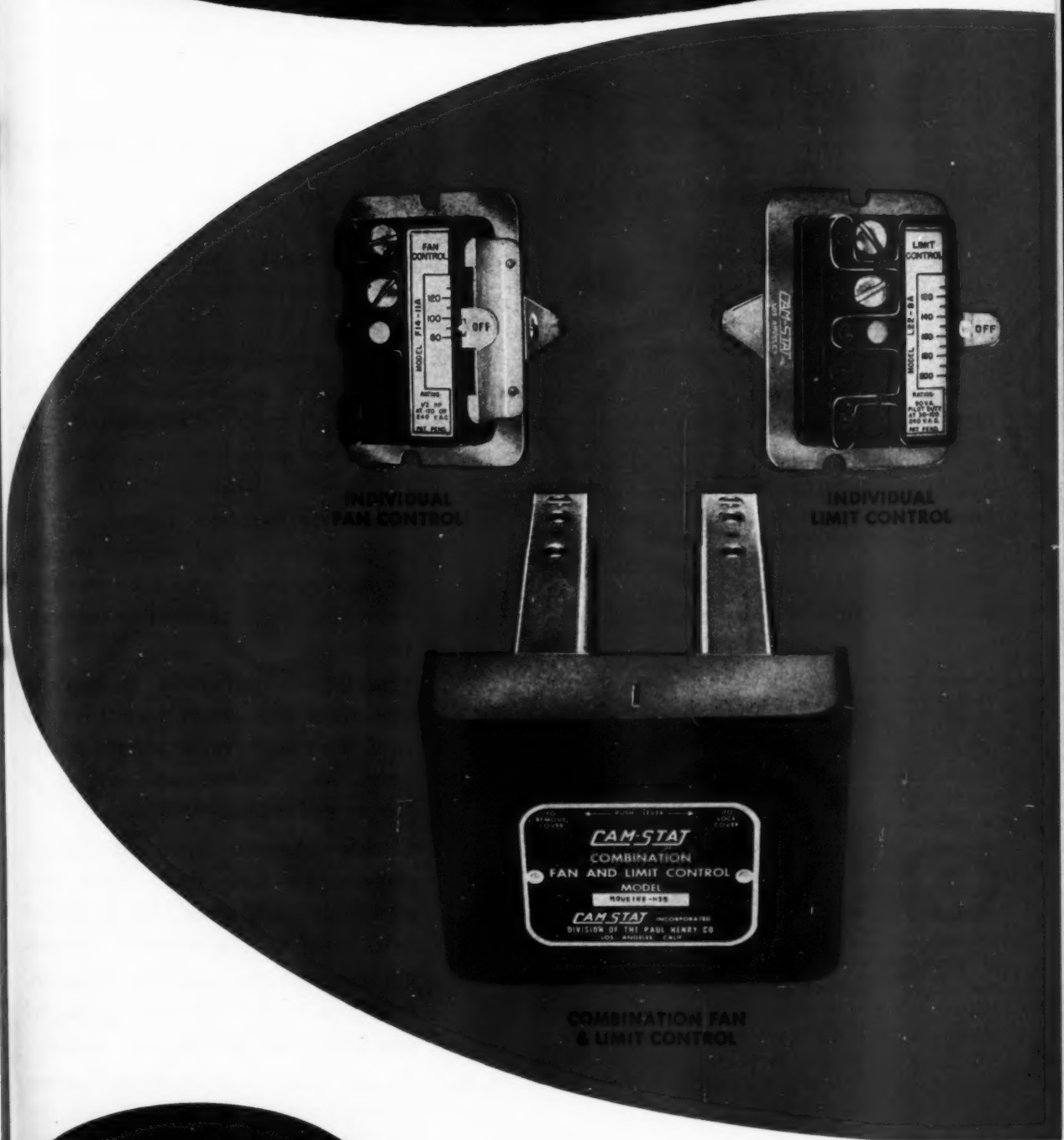
- EXTREME SENSITIVITY
- SNAP ACTION SWITCH—CLEAN MAKE & BRE
- HIGHEST QUALITY
- LISTED BY UNDERWRITERS' LABORATORIES, I
  *and*
- CANADIAN STANDARDS ASSOCIATION

AND BY REDUCING SERVICE CALLS TO A MINIMUM

## *there is more profit for dealers, too!*

# *Complete flexibility with highest quality*




INDIVIDUAL FAN CONTROL

INDIVIDUAL LIMIT CONTROL

COMBINATION FAN & LIMIT CONTROL

CAM-STAT

*Division of The Paul Henry Company*
11833 W. Olympic Blvd., Los Angeles, Calif.

**NO THERMOSTAT CAN EXCEL CAM-STAT'S RECORD OF FINE SERVICE**

# Periodic Inspection Assures Good Cooler Service

(Continued from page 78)

conserve water. If a cooler is furnished with such a pump, it is necessary to provide a satisfactory method of bleedoff. Fig. 1 shows a cooler pump with a connection for bleedoff. Evaporation of the sump water increases the concentration of the dissolved minerals. These uncontrolled concentrations result in the precipitation of calcium and magnesium carbonate scale into the sump water. The accumulation of scale reduces air flow and cooling, as well as causing a fouling of the water distribution system.

### Mineral Concentration Must Be Checked

The seriousness of this problem may be graphically illustrated by the actual buildup of the mineral concentration in a typical evaporative cooler. A 6000 cfm cooler using recirculated water having a twenty grain hardness may precipitate over 50 lb of salt in one season. A bleedoff is essential to good cooler performance and for minimum maintenance. By continually drawing off a portion of the sump water so the mineral concentration does not become high enough to cause scale deposits, the scale problem can be largely controlled.

The bleedoff rate for evaporative cooling equipment may be determined from the formula:

$$B = [C_1/(C_2 - C_1)] \times E$$

in which $B$ = bleedoff rate in gph; $C_1$ = hardness of supply water in grains per gal; $C_2$ = hardness of sump water in grains per gal; $E$ = rate of evaporation in gph.

To use this formula a water analysis must be made to determine hardness and chloride concentration of the supply water. Since chlorides are highly soluble, the increase in chlorides in the sump water may be used as a safe index of the extent to which reconcentration of solids is taking place. If an analysis of the sump water shows that the actual hardness is less than the reconcentration indicated by the chlorides, salt is undoubtedly being precipitated in the cooler and the rate of bleedoff should be increased. In those installations that do not economically justify water analysis, satisfactory control of scaling usually can be obtained by bleeding off at a rate equivalent to half the amount of water evaporated. This will approximate 1 gph per thousand cfm and will give a reconcentration of solids three times that of the supply water.

### Check List Simplifies Maintenance

A preventive maintenance program or schedule should be established for evaporative cooling systems in the same manner that a furnace is overhauled prior to the start of the heating season. A through inspection should be made of the system, following a predetermined list of points during the standby period. A systematic preventive maintenance program should minimize routine maintenance during the cooling season.

## 8 Points of Preventive Maintenance

- **Clean cooler of all dirt, scale and debris. If any rust spots are present, sand and repaint with a suitable rust resistant coating.**
- **Replace evaporative pads. Be sure new pads are equal in size, thickness and density to those originally supplied by the cooler manufacturer.**
- **Lubricate blower motor, blower bearings and pump motor using grade of oil recommended by the cooler manufacturer.**
- **Check recirculating pump to see that the shaft turns freely and that the motor starts properly. Also check operation of float valve.**
- **Check blower bearing thrust collars to see that they are properly adjusted to prevent end play of the blower wheel.**
- **Check belt for proper tension. Replace it if it shows signs of cracking or excessive wear.**
- **Clean out water distribution system and troughs. Check for evenness of water flow to each evaporative pad.**
- **Check load on motor with ammeter. Adjust pulley ratio to prevent overload if necessary.**

*Matchless Beauty and Performance In Heating and Cooling*

# Lima MATCHED PERIMETER BASEBOARD LINE

HERE — at competitive price — is the finest, most beautiful line of *matched* baseboard units you can install for heating and cooling in new houses and modernization jobs.

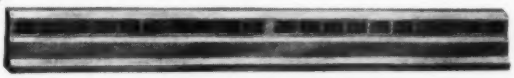
All Lima baseboard diffusers and return air grilles have horizontal louvers which harmonize perfectly with the horizontal lines of baseboard, window and floor. All units have the same permanent medium beige finish which saves repainting cost unless requested by the customer. And all Lima baseboards have exclusive features that reduce installation time and labor.

The performance is just as outstanding. The Lima Baseboard Diffuser assures efficient air diffusion spread evenly over a wide area regardless of velocity or damper setting. Reasonably high velocity and correct vertical angle induces recirculation of air within room for gentle, imperceptible air motion.

It costs no more to give your customers the matching beauty, extra sturdy construction and matchless performance of Lima Matched Baseboard Diffusers and Return Air Grilles. Ask your wholesaler or write direct for literature and prices.

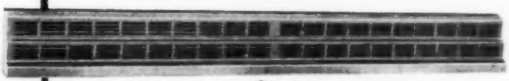
## Series 70

**DIFFUSER** with rattle-free built-in automatic pushbutton damper.



## Series 75

**DIFFUSER** without damper, for economy installations.

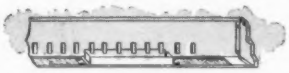


## Series 77

**NEW RETURN AIR GRILLE** with maximum free area, for matching beauty and performance.

## FASTER INSTALLATIONS IN NEW AND OLD HOUSES

**Boot can be quickly located any place along bottom of diffuser or grille without expensive cutting. Base has pre-cut boot openings separated by easily removable ⅜" mullions and boot fastening clips stamped in back section to hold boot in place.**



**Steel strip furnished with diffuser unit to seal openings not used. The entire operation is done in a jiffy.**

**Smoke test photos show full fan-shaped blanket of air spread over wide area. Air pattern holds constant even at low cfm delivery, and velocity remains uniform without whistling.**

**Note correct vertical angle which eliminates wall scrubbing and prevents air from striking room occupants.**

Lima REGISTER CO.
LIMA, OHIO

INDOOR COMFORT

**Lima Quality Diffusers, Registers and Grilles Are Sold Exclusively Through Heating Wholesalers and Manufacturers.**

TAKE TIME to show the customer the various products available, help her select one that meets her needs as well as her personal preference

# Put More Merchandising Power in Retail Selling

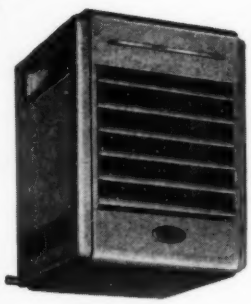
**Everybody agrees more merchandising — not price cutting — is the road to bigger profits and more sales. Some dealers, however, aren't aware of the wealth of selling tools available from their manufacturers and distributors**

OSCAR WILDE ONCE wrote, "Let me have the luxuries and I'll forego the necessities." To anyone who objectively reviews retail practices and results during the 1955 season, it is very much apparent that some retail firms were somewhat disposed to a similar philosophy. Many retailers, despite the fact that they had increased their sales estimates for the year, unwisely permitted themselves to forego the necessity of an extensive planning program. They should have concentrated on additional merchandising power and more authentic salesmanship. Some retail dealers — including some warm air heating and residential air conditioning dealers who had grown accustomed to "easy selling" which had required no special local advertising or promotion — found that the sales road was extremely bumpy and downright precarious.

Much of the concern of these dealers was caused by down-the-street competitors, perhaps with less imposing establishments or more expensive lines, who obtained a major share of the community's business volume. Consequently, the question was raised, "Why did our competitors, working under apparent business handicaps, score so successfully?" It would seem that their success was definitely not adventitious. They simply realized high dividends on the investment they made

*(Continued on page 88)*

# UTILITY UNIT HEATERS MAKE A LOT OF SALES-CENTS



UNIT HEATER

Any way you look at the new Utility unit heaters, you're bound to agree: they're handsome additions to a most complete line. But handsome is as handsome does, and these feature-loaded unit heaters are guaranteed to deliver the bonus performance you expect of Utility without any "bonus" being added to the purchase price.

To durable good looks add these features of the future, extra reasons to specify Utility: Bonderized undercoat and handsome baked enamel finish; Armor-Glas® protected heat exchanger to prevent corrosion; completely pre-wired at factory with Summer-Winter switch; automatic fan control that delays fan operation until unit is heated; 24-volt control system for easy installation.

Only Utility gives you the years-ahead design, superior engineering and down-to-earth price tags that sell the job . . . plus the guaranteed dependability that keeps it sold.

UTILITY APPLIANCE CORP.
Manufacturers of Utility Furnaces, Air Coolers, Air Conditioners, Water Heaters and Gaffers & Sattler and Occidental Gas Ranges.

UTILITY
TRADE MARK

UTILITY APPLIANCE CORP. 4851 south alameda street, los angeles 58, california

# ECONOMY 2 H.P.

*FOR YEAR AROUND AIR-CONDITIONING AND HEAVY DUTY WINDOW COOLERS*

**MODEL B74T16**
**SINGLE PHASE**

# Tecumseh's NEW air cooled HERMETIC COMPRESSOR

*FOR FURNACE OR ATTIC SYSTEMS — WINDOW COOLERS*

*DIRECT OR ADD-ON UNITS*

Now you can bridge the gap between 1½ and 2 H.P. compressors with the new Tecumseh hermetic. A single phase, air cooled compressor which will deliver 19,500 B. T. U. capacity at ASRE conditions, it affords adequate cooling for the smaller, low cost home at a considerable price reduction. Applied to an add-on furnace unit or attic system where full 2 H.P. capacity is not required, model B74T16 gives "economy" 2 H.P. performance and allows you to broaden your market for central air conditioning. It is also used in heavy duty window cooler applications.

Additional advantages are also realized in the inherent construction features of Tecumseh hermetic compressors. The utilization of suction gas within the welded steel shell to dissipate motor heat gives more efficient cooling. Also, even though our tests indicate that the compressor can be properly lubricated with 30 ounces of oil, almost double this amount is used to give our customer an adequate safety factor. This extra insurance is particularly important when the system is started up after a long shutdown. The use of Freon 22 permits a more compact compressor design and lends itself to capillary tube application for additional savings in component parts.

You will agree, for economy and performance, Tecumseh's new hermetic compressor provides a practical answer to your air conditioning application.

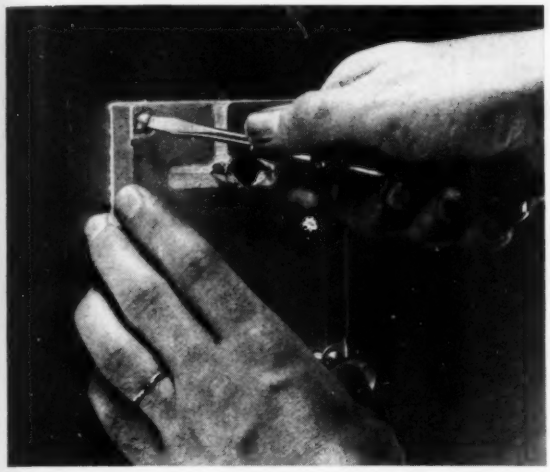
**TECUMSEH PRODUCTS CO.**

*The World's Largest Producer of Compressors for the Refrigeration Industry*

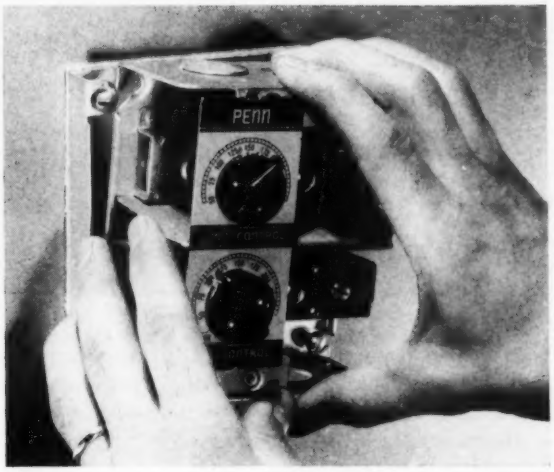
*Marion, Ohio*
*Tecumseh, Michigan*
*Danville, Illinois*

**EXPORT DEPT.—P. O. Box 2280, 24530 Michigan Ave., W. Dearborn, Michigan**

# It's As Easy As "1-2-3" To Install Penn Combination Fan and Limit Control



**1.** Cut 1¼" power element hole. Drill 2 mounting holes, using asbestos seal as template. Start mounting screws through bracket.



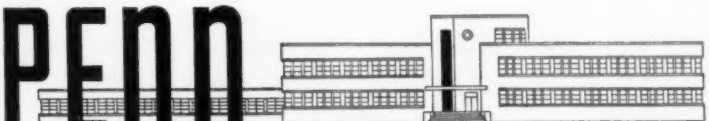

**2.** Insert power elements and hook slots in control case under screw heads, then tighten screws.

Easier and faster to install . . . even in cramped quarters or in poor lighting . . . it isn't necessary to mount the Series 520 in a level or vertical position! But that's just part of the story.

Penn combination fan and limit controls are designed for low, line or millivoltage service . . . *at no extra cost.* Penn's superiority is recognized by customers, too. They know Penn controls mean healthful comfort. They know the Penn name means accurate and dependable operation. It's the kind of dependability that eliminates, for you, those costly service call-backs.

On your next heating job, specify Penn controls . . . *they cost no more!* Penn furnace controls are also available in single units . . . for fan only, or limit only. Be sure to ask your burner manufacturer or wholesaler for Penn heating controls. **Penn Controls, Inc., Goshen, Ind.**

**3.** Place control cover in position and secure 2 retaining screws. That's all you do . . . it's simple and fast.




**FOR HEATING, REFRIGERATION, AIR CONDITIONING, GAS APPLIANCES, PUMPS, AIR COMPRESSORS, ENGINES**

# Merchandising Constitutes 'Customer Farming'

(*Continued from page* 84)

USE AVAILABLE promotion materials to close the sale once the customer has been conditioned by advertising and other sales aids

by planning their yearly sales program many months in advance of the actual selling season!

Merchandising — incorporating a planned twelve month sales promotion program, direct mail promotion, personal and phone canvasses, local advertising, utilization of promotional material and publicity opportunities, attractive product display and close follow-up constitutes "customer farming" for the dealer. For a successful harvest, the retail dealer, just like the farmer, must develop a definite pre-season program of preliminary activities. In the field of air conditioning there are hundreds of firms both large and small which have enjoyed continuous and increasing success because of this type of scientific "sales farming." However, in air conditioning as in other business categories, many dealers did not take sufficient time to prepare the ground prior to the selling season.

With residential air conditioning, there is an additional side to the picture. Familiar with the tremendous potential of the air conditioning industry, many heating firms have entered the field since 1950. A large portion of this group has shown excellent progress. From the beginning they have sold and installed units, and they have made money. Other recent entrants, on the other hand, were somewhat disillusioned by their sales experiences.

### Many Newcomers Oversold

Results did not meet expectations because in most instances they had but added "Air Conditioning" to their company letterhead, ordered a supply of literature and sat back to await an influx of customers — an influx that did not materialize to the degree they felt it should have. What happened was that recognizing the terrific market for air conditioning they allowed themselves to be oversold, permitting their enthusiasm to veil the fact that a tremendous selling job must still be done. While popular with the businessman and homeowner, air conditioning is only one of many new items they would like to purchase. Depending on the individual, the I-would-like-to-buy-list may include a new truck or family car, a new store front, new office equipment, new fixtures, a fur coat, a recreation room, new furniture, a new kitchen, or a new air conditioning system. Usually, because of budget limitations, one choice is made. The selling assignment for the air conditioning dealer is to present his merchandise in such a way that it becomes first choice in the mind of the consumer. Indicating that the case for air conditioning is being well presented is the fact that consumer surveys reveal that volume cooling business is available in every locality. Nevertheless, to be realized it must be cultivated with planned merchandising.

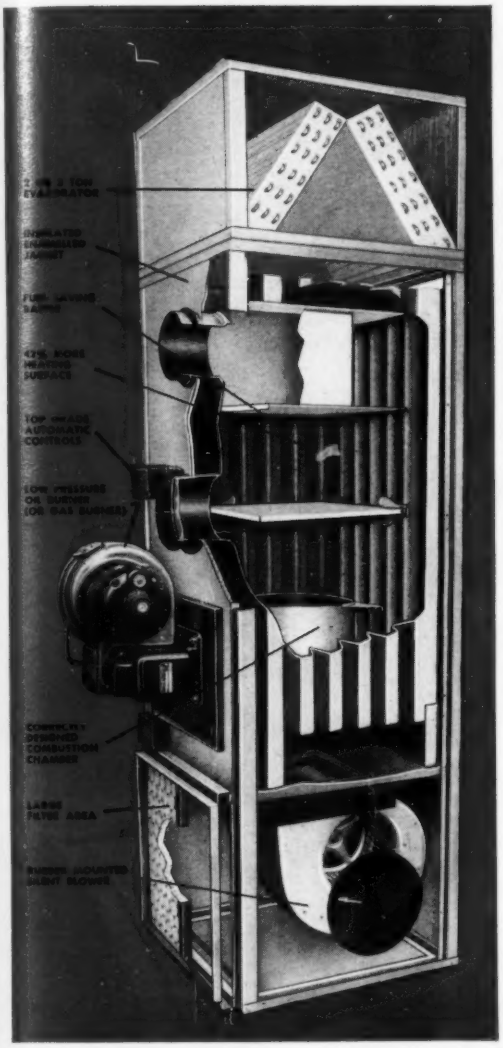
### Budgeted Program Cuts Costs

At the present time the majority of people in any way associated with new construction or modernization (residential or commercial) have accepted air conditioning. Efforts must be concentrated at the point where mass sales are actually consummated — at the retail level. Therefore, heeding the evolution of the air conditioning sales picture, it is necessary to place emphasis on improving the merchandising techniques of the dealer and his salesmen, who have entered the air conditioning field in recent years. The retail dealer must introduce the product to the purchaser by bringing them together either through his salesmen or at his place of business. The initial introduction is always accomplished through some form of merchandising.

In promoting a More Merchandising Power at Retail program, special

(*Continued on page* 92)

# Introducing the Winkler "GO"



***...a genuine advance in all-year air conditioners—oil or gas fired***

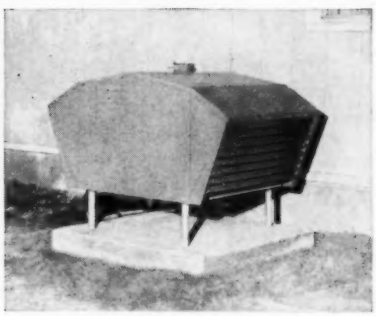
Another money-maker for Winkler Franchised Dealers! The "GO" offers all the economy and dependability features of Winkler Furnaces—*with cooling equipment now added!* You have to see the "GO" to fully appreciate the quality of its exclusive design and long-life construction.

The "GO" is *flexible*—can be installed either as a complete heating-cooling system, or with the special evaporator casing left empty for future addition of the cooling coil. The compressor-condenser unit is installed outdoors.

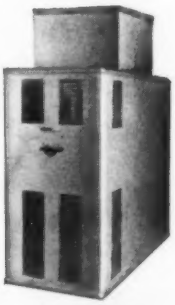
Shipped as a complete "package", the Winkler "GO" is available in models for basement or utility room installation and for conventional or perimeter type systems. *It costs less to install*—the filter is housed in a frame which can be placed in any of five positions, assuring greater adaptability to various installing situations and lower duct costs.

Write today for the facts on the Winkler "GO"—and how to obtain a Winkler Direct Factory Franchise.

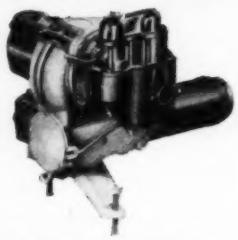
**Up to 42% more heating surface**
The corrugated Heat Exchanger has almost one half again as much heating surface as conventional types—transmits more heat—keeps fuel bills down.



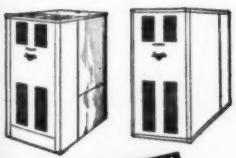
**Remote compressor unit**
Installs outdoors—no noise in the home. Available in water and air cooled models.



**Model WB**
For basement installation. Casing for evaporator coil is located at top of unit.

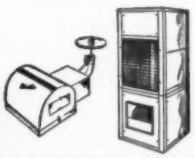


**Money-saving oil burner**
Oil-fired units are equipped with the Winkler LP low pressure burner—proved to save as much as 50% in fuel.



**Oil and Gas-Fired Boilers and Furnaces...Gas Conversion Burners...Oil Burners...Stokers...Air Conditioners**

# WINKLER



A PRODUCT OF SW STEWART-WARNER

**WRITE TODAY FOR DIRECT FACTORY FRANCHISE DETAILS**

## STEWART-WARNER CORPORATION

**U. S. MACHINE DIVISION • Dept. A-125 • LEBANON, IND.**

AUTOMATIC • WINKLER HEATING EQUIPMENT

# Tired of it?

It's done more politely . . . but let's face it . . . *factory* competition on the BIG jobs *is* like a push in the face to any dealer. That's not Perfection's way of doing business. We believe in *helping* our *dealers* get the *big* jobs—and the small ones—in their territory. What's more, Perfection offers the exclusive Regulaire and the 3-Stage Fire. It pays to ride with the manufacturer who goes right down the line with *you*. Write Perfection Industries, Division of Hupp Corp., Dept. 7616-L, Platt Ave., Cleveland, Ohio.

TALK TO **Perfection**
AUTOMATIC HEATING

*This is not an idle claim . . . it's a fact . . . PROVEN UNDER ACTUAL INSTALLATION AND MAINTENANCE CONDITIONS.

Make no mistake about it . . . no matter how *small* your filter requirements . . . or *how large*, here is a completely new air filter development that can *absolutely cut your clean air maintenance costs in half.*

NO HEAVY TENSION OIL — Evans filters do not have a messy, sticky type of adhesive that is filthy to handle and difficult to clean. It is unnecessary and is forbidden in the use of Evans filters.

CLEAN WITH TAP WATER — Evans filters can be cleaned clean in minutes with nothing ever but tap water sprayed through an ordinary garden hose nozzle. They require no expensive fireproof room. No caustic cleaning solutions or agents. This eliminates all danger in the cleaning of Evans filters.

LIGHT WEIGHT CUT LABOR COSTS — Evans filters are all aluminum. Light to handle, to carry, to pick up. In spite of airtight fitting frames, Evans filters pull quickly and easily in and out of the frames. Take much less effort, less labor to handle. No latches . . . or lugs *required.*

**REMEMBER:** Initial costs for air cleaning equipment are not the big factors or controlling factors in the cost for clean air.

IT'S OPERATING COSTS THAT YOU MUST LIVE WITH AND THAT YOU MUST CONTROL.

EVANS FILTERS GIVE YOU THAT CONTROL. MAKE IT POSSIBLE FOR YOU TO SAVE 50% ON CLEAN AIR MAINTENANCE COSTS.

- ALL ALUMINUM
- EVERY PART PRECISION MADE
- HOLD UP TO 200% MORE DUST
- AND LINT WITHOUT HARMFUL RESTRICTION TO AIRFLOW
- GIVES LIFETIME SERVICE

**FREE CATALOG** MAIL COUPON TODAY

THE GEORGE EVANS CORPORATION · MOLINE, ILLINOIS

Gentlemen: I wish to know how to cut my clean air maintenance costs in half with a filter that gives lifetime service. Please send me new illustrated catalog.

Name .....

Company .....

Address .....

City ..... State .....

Evans

*Lifelong* AIR FILTERS

# Plenty of Merchandising Help Available

(*Continued from page* 88)

attention from the outset must be accorded residential air conditioning dealers. There are still many who feel that merchandising — that is extensive merchandising — is either too expensive, too time consuming or too great a project for a limited staff to handle effectively. Through education, however, this thinking is changing. While it must be consistent, merchandising need not be expensive or require a vast amount of the dealer's valuable time. Dealers following a planned program have found that the cost of comprehensive merchandising is actually very nominal when budgeted over a twelve month period. As for the dealer's time, all that is required is cooperation with his distributor and manufacturer, who will aid in the development of a continuous merchandising program, a promotion timetable tailored to the dealer's individual requirements; a program that will blanket his particular sales area; one that will produce the quantity of business he should obtain and is capable of handling; a program that will keep his name and products constantly before the public and which will establish the groundwork for future expansion. Once a timetable has been decided upon, each phase must be executed on schedule inaccordance with the preconceived plan.

### Manufacturer Starts Ball Rolling

One such program includes national advertising by the manufacturer to obtain consumer acceptance of a product's name. This is often followed by giveaway awards to the consumer who will send in for further-information about the product. These leads are forwarded to the dealer for the follow-up procedure.

The sample merchandising program makes available for the dealer's use various ad mats for newspaper advertising, radio and television spot announcements, special displays, descriptive literature, direct mail pieces, window and counter displays, decals, sample publicity releases for local newspaper home departments, sales training programs for sales and service men and sample sales approaches.

The sample continues with a month-by-month outline of procedures for the dealer to follow. He may use one of several plans — select the one best suited to his own operation. These plans incorporate methods of drawing the prospect's interest to the dealer's merchandise, developing the prospect's interest after the initial contact, and explain how to close the sale.

### Merchandising Kits Available

Many of the plans use eye appealing displays, some for the display floor, others which are portable and are designed for use in a prospect's home or place of business. These displays are designed to hold the prospect's interest while the salesman gets his story across — the story that has been developed to accompany the display. Frequently such a display kit contains colored diagrams of sample systems which show how the equipment will appear when installed.

All phases of the merchandising program are planned to fit together and yet be flexible enough to serve each dealer in the manner best suited to meet local business conditions.

Most manufacturers or distributors will assist in executing a major portion of a dealer's merchandising program relieving him of all time consuming activities, except for the two most important steps — prospect follow-up and actual person-to-person selling. In a sense, the manufacturer or distributor can carry the ball to the goal line, but as always, it remains the retail dealer's responsibility to push it across the line for the final score.

### Price Cutting Weakens Market

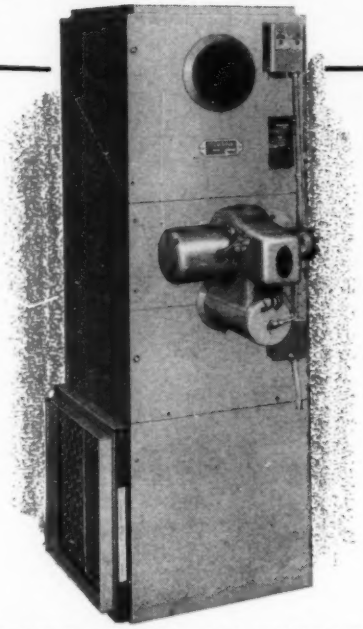
Dealers have to be and are economists. They are aware that business conditions never were more favorable than today. They know too, that indiscriminate price cutting which has occurred in some instances, will not, over an extended period, contribute to maximum sales activity. Price cutting eventually fosters market constriction rather than expansion. Thus, many dealers agree that the proper method to stimulate consumer interest, to maintain profitable sales volume and a strong national economy is to promote the products through well planned, continuous, and attractive merchandising programs.

# Merchandising Keynotes Modernization Program

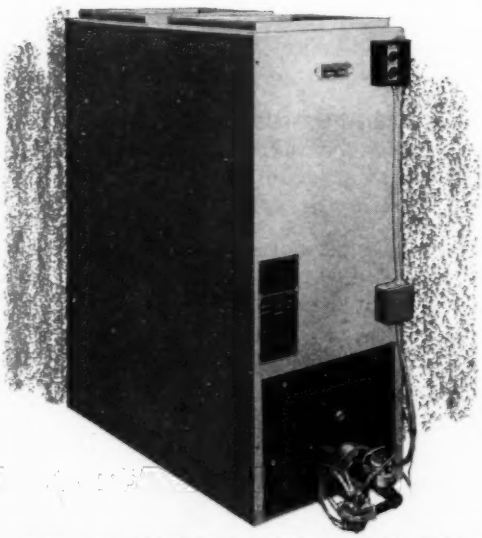
Operation Home Improvement is ready for a flying start. The all-out merchandising program, aimed at the modernization market and combining the promotion efforts of manufacturers, dealers, contractors and everyone concerned with the home market, will be felt by millions of home owners via trade and consumer publications, radio, TV and every conceivable medium for telling the modernization story to the older home market which is its target.

The warm air heating-residential air conditioning dealer and contractor has a big stake in this huge program. Similar in its aims to WHAM (Warm air Heating and Air conditioning Modernization) from the dealer-contractor's point of view, Operation Home Improvement is designed to provide modern comfort facilities for every room in every home which can be reached. As with WHAM, the National Warm Air Heating and Air Conditioning Association will play a large part, but the bulk of the modernization dollars will go to the tradesmen who put real effort into identifying themselves with the program in 1956.

# Sell these modern fluid heat *quality* heating units priced for your builder trade!



Oil-Fired Hi-Boy Oil Model SU-84: 63⅞" high, 21" wide, 35" long (incl. burner); 84,000 BTU/hr. output. Also available: Hi-Boy Model SU-112: 67⅞" x 23½" x 37½" (incl. burner); 112,000 BTU/hr. output. Both UL approved. Also available in gas-fired units of comparable capacities.



Lo-Boy Gas Model GL-9: 53" high, 21" wide, 51" long (incl. burner); 90,000 BTU/hr. input, 72,000 BTU/hr. output. AGA-approved for use with natural, mixed, manufactured or LP gas. Also available in comparable capacity oil-fired unit—Model B-84.

## Here's what you can offer builders!

- **Rock-bottom prices with no drop in famous Fluid Heat quality!**
- **Wide range of models and sizes!**
- **Prestige of a top name in the industry!**
- **Satisfied customers, with no comebacks!**

Here's a new line of Fluid Heat heating units, designed specifically for the building trade. Each unit boasts the same Fluid Heat quality features and top construction as always—only the frills have been left off. And the price has been cut 'way back to put you in a favorable competitive position. If you are looking for a good connection, it will pay you to mail the coupon for more details!

fluid heat®
AUTOMATIC HEATING EQUIPMENT

"WORLD'S ECONOMY CHAMPION"

MAIL COUPON NOW FOR FULL DETAILS!

ANCHOR POST PRODUCTS, INC., Fluid Heat Div.
6720 Eastern Ave., Baltimore 24, Md.

I want to become a Fluid Heat Dealer. Send me details on the complete line.

Company Name.....

My Name.....

Address.....

City..... Zone..... State.....

# Modern Truck Features That Mean Business!

**Chevrolet trucks have got it! A full list of modern features that mean better business—on the job today and at trade-in time tomorrow!**

When you get right down to it, any truck without all of Chevrolet's Task-Force features is still living in the past. Why risk losing money with an old-fashioned truck—both on the job and at trade-in time—when you can get a Task-Force model with the industry's most advanced features?

**Most modern power—V8 or 6.** There's longer life in Chevrolet V8's (extra cost in most models). With their short-stroke design—shortest of any leading truck—you can count on less friction and wear per mile. If you go for sixes—Chevrolet's gas-saving valve-in-head sixes are famous for their dependability. All engines are sparked by a modern 12-volt electrical system for quicker starting and smoother going!

**Most modern comfort and safety features.** New efficiency boosting advances like panoramic windshield, High-Level ventilation, softer seat action and concealed Safety Steps!

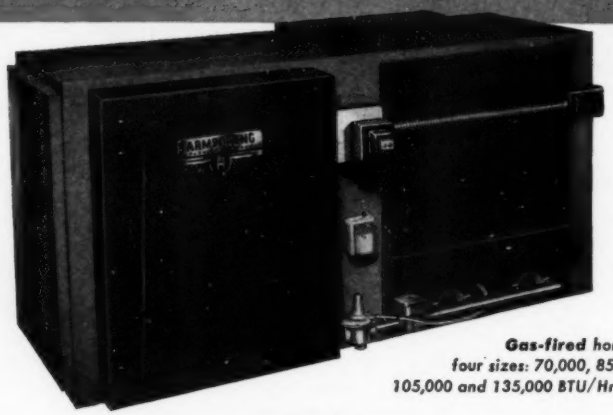
**Most modern chassis features.** New suspensions; new, more rigid frames; tubeless tires standard on ½-ton models!

See your Chevrolet dealer for details. . . . Chevrolet Division of General Motors, Detroit 2, Michigan.

## NEW CHEVROLET Task-Force TRUCKS

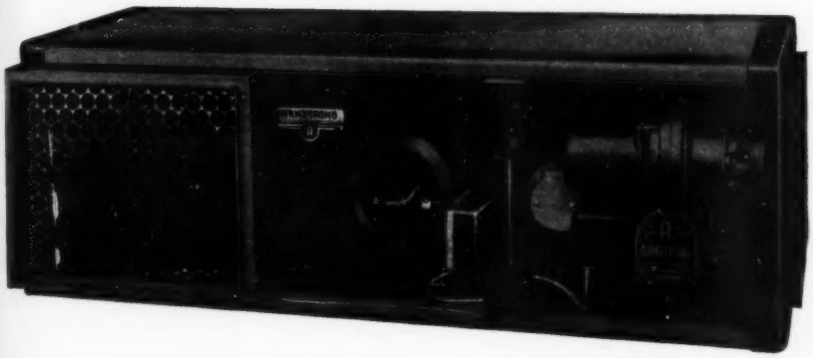
CHEVROLET

# *In horizontal furnaces*
# THE SWING IS TO ARMSTRONG
## *The line with sales-building features*



***Gas-fired** horizontals in four sizes: 70,000, 85,000, 105,000 and 135,000 BTU/Hr input*

***Oil-fired** horizontals in four sizes: 84,000, 112,000, 140,000 and 165,000 BTU/Hr output*



***Put these money-makers to work for yourself!***

**GAS:**

- Meter-Flame burner
- Swirl-Tube heat exchanger
- Built-in filter rack
- Cushion-Air blower
- Uni-Weld cabinet
- Reversible heat exchanger
- Clear, smooth air path
- Compact design

**OIL:**

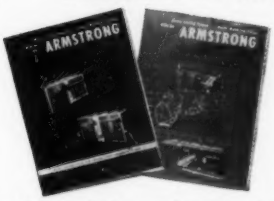
- Armstrong-built burner
- Exclusive Turbo-Regulator air control
- Custom Flame Stabilizer
- Refractory combustion chamber
- Cushion-Air blower
- Versatile return air
- Built-in filter racks
- Dust-tight cabinet

Armstrong horizontals—in both gas and oil burning models—are sky-rocketing in sales. They are proving themselves *on every count,* to both dealer and householder.

To you, the dealer, because they are available in four sizes for each of the two fuels, which blanket the demand; because they are priced right, even for the housing development market; because they come to you assembled; because they incorporate many sales-building, time-saving, money-making features; because they are extremely compact.

To the householder they are *wonderful*—true winter air conditioners—completely automatic—trouble-free — economy-priced — fuel-savers—and masters of comfort. (Satisfaction like that makes friends for *you,* too.)

**Send for these *horizontal bulletins***




Get these bulletins on Armstrong horizontal furnaces—one on gas, one on oil—from your nearby Armstrong wholesaler, or write to us at Dept. AA for copies. Beautifully modern, they illustrate and describe the Armstrong horizontal line, and give specifications and features. They'll help you sell, but first they'll show you a line you'll like.

ARMSTRONG FURNACE COMPANY

**ARMSTRONG FURNACE COMPANY**

COLUMBUS, OHIO — DES MOINES, IOWA

ACCEPTED BY ADVERTISING IN today's health PUBLISHED BY THE AMERICAN MEDICAL ASSOCIATION
COMMENDED BY THE CONSUMER SERVICE BUREAU OF PARENTS' MAGAZINE AS ADVERTISED THEREIN

# Basic Rules Govern Shearing Techniques for Sheet Aluminum

FOOT SHEAR can be used effectively on aluminum sheet if specified clearances are observed and handling precautions such as the use of lined hold-down pads and protective coverings are practiced

**Shearing and sawing procedures are little different from those used on other metals if the properties of aluminum are considered**

**By G. W. Birdsall**
**Reynolds Metals Co.**

SHEARING IS OF COURSE one of the important phases of shop operation with sheet metal, and as with other fabrication techniques discussed previously, need cause no special anxiety when applied to sheet aluminum if a few of its basic peculiarities are understood.

### Avoid Scuffing, Observe Proper Clearances

Guillotine shearing, while very effective with aluminum, requires certain precautions. To avoid marking the surface of the sheet, hold-down pads should be faced with rubber or other shock absorbing material. Make sure that the shear bed and tables or benches used for handling aluminum sheets in and out of the shear are not rough, which may cause scratches and other undesirable scuff marks on the aluminum. To minimize the possibility of such damage, shellac some heavy cotton flannel to the surfaces. In guillotine shearing closer clearance is required for "O" (annealed) material than for tempered and heat treated material. Slitter knives should have a clearance of 0.0015 in. for all alloys and tempers.

Only a few factors need be remembered in cutting aluminum. Conventional tools may be used in the shearing or cutting operations. All tempers of the lighter gages can be cut easily with sharp, closely adjusted hand snips. Both hand and power sawing can be performed on aluminum sheet. Use a hand saw for the light gages of most alloys and a power saw for heavier gages and harder alloys. Hand sawing may be done with an ordinary wave-set hack saw blade with 15 or more teeth per in. In power sawing, high speed and adequate lubrication are the important factors. For extremely fine work a jeweler's blade should be used.

### Check Teeth and Speed Settings For Sawing

Band saws are very satisfactory for sawing aluminum. Operating speeds of the band saws vary from 1500 to 3000 fpm with blades having 12 to 32 teeth per in. Either straight or wavy teeth may be used. Adjacent teeth on the straight type are set in opposite directions; with the wavy type the groups of teeth have opposite set. Friction sawing may involve speeds of 9000 to 12,000 fpm.

## On duct-insulation jobs—

# Low installation cost of Microlite and L·O·F Super·Fine can clinch the contract

**Speed and ease of application can mean the difference in cost it takes to clinch a big insulation contract. That's why many contractors use L·O·F Glass Fibers' Super·Fine and Microlite to cut application costs without sacrificing insulating efficiency.**

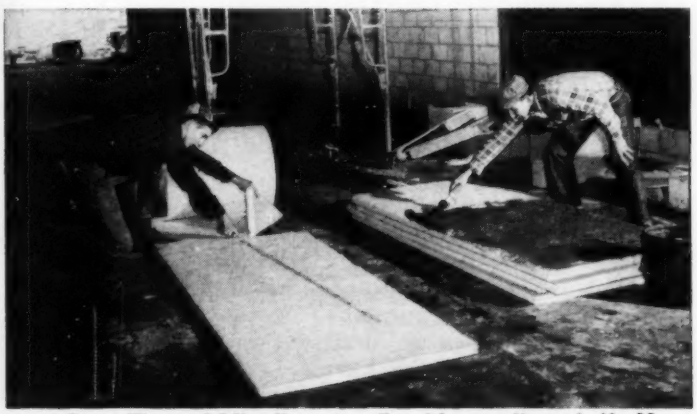
*You'll find it simple to apply*—These soft-textured blankets are pleasant to handle, quick to apply. Require no special tools or skills. Lightweight, resilient L·O·F Super·Fine and Microlite fill hard-to-reach places and are easy to manage on tall ladders or scaffolds. An unskilled worker can apply an average of 500 square feet of insulation a day.

*The high insulating efficiency* of Microlite and L·O·F Super·Fine results from the countless dead air cells formed by millions of fine glass fibers, which effectively reduce heat loss or gain.

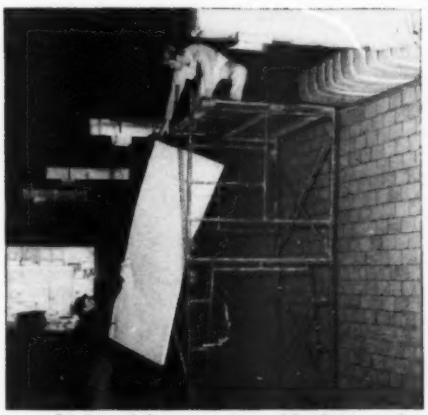
*Save on storage space, too*—L·O·F Super·Fine and Microlite come in tightly compressed rolls that take up less space and spring back to full thickness when unrolled. Available in blanket form up to 72″ wide, 5″ thick and from 50′ to 200′ long, depending on thickness. Also available with various facings to meet different insulation and code requirements.

*Save on duct application costs* with Microlite or L·O·F Super·Fine duct wrap and duct liner. Look in the Yellow Pages of the telephone directory for the name of our nearest distributor. or write: L·O·F Glass Fibers Company, Dept. 45-125, 1810 Madison Avenue, Toledo 1, Ohio.

## Time- and cost-saving steps in a typical duct application



**1.** Super·Fine and Microlite cut easily with an ordinary knife. No precision measuring or fitting required. In this case, adhesive is brushed on the insulation.



**2.** Lightweight, strong blankets of Microlite or Super·Fine handle easily on scaffolds or ladders.

**MICROLITE**

L·O·F GLASS FIBERS

**SUPER·FINE**

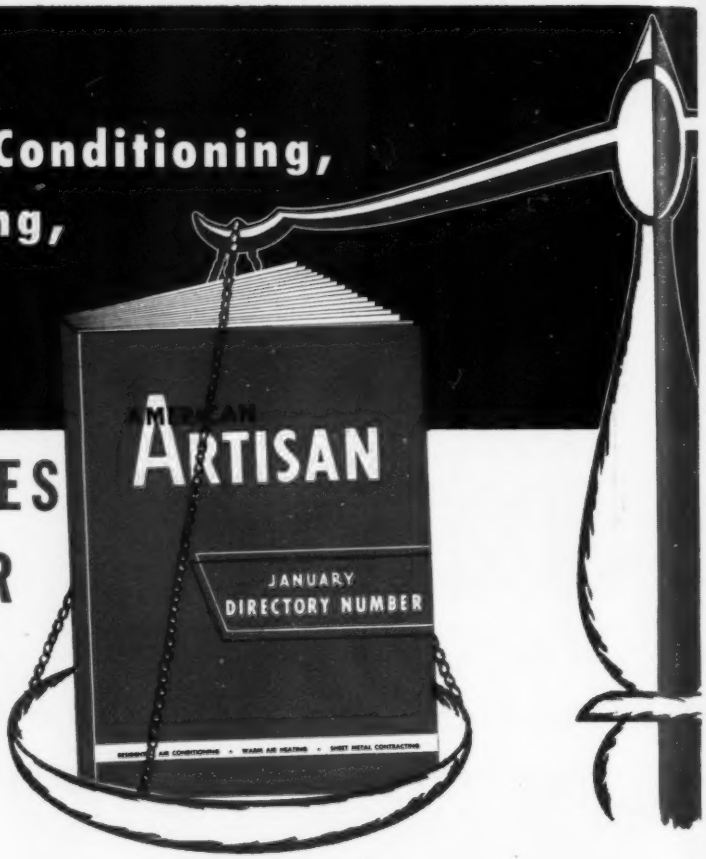
**L·O·F GLASS FIBERS COMPANY**

**TOLEDO 1, OHIO**

Makers of glass fibers by the exclusive "Electronic-Extrusion" process

**3.** Super·Fine and Microlite can be fitted quickly around the duct and supporting hangers. Light-gauge wire ties complete the job.

# If you sell to the Residential Air Conditioning, Warm Air Heating, Sheet Metal Market...




# TIP THE SCALES in YOUR FAVOR throughout 1956

## *Use this field's Accepted Buyers' Guide*

**By no other means** can you accomplish so much at so little cost.

Promoting your products in American Artisan's January Directory Number is a BASIC job — a fact recognized by well over 200 advertisers who take advantage of this opportunity each year.

Dealers, contractors, wholesalers, and manufacturers constantly need up-to-date information on sources of supply. In the most complete form available, they find such data in our Directory Number:

- An alphabetical listing of all products the field uses.
- Names and addresses of the manufacturers.
- All known trade names.
- A guide to the products advertised in this issue and the manufacturers' names.

Here's information your customers and prospects will be referring to throughout 1956 when buying decisions are made. Without question, your product story in this issue will have LASTING sales power.

In addition, as a regular January issue (not a 13th or premium cost number), there will be normal editorial content assuring immediate cover-to-cover attention.

**It all adds up to an unequalled opportunity.** In American Artisan you have the book that reaches the greatest concentration of buying power — the more progressive dealers and contractors who handle 80% of the available business . . . the book that delivers the only fully paid (ABC) circulation in the field . . . the book that excels in editorial content . . . the book that leads in advertising volume . . . the book that best covers Residential Air Conditioning's acknowledged outlet — the Warm Air-Sheet Metal Dealer.

And in American Artisan's **January Directory Number** you have the added value of an issue designed to promote sales all during the year. Take sufficient space, perhaps a spread, an insert, or multiple pages, to present complete buying information. Regular space rates apply.

KEENEY PUBLISHING . . . 6 N. Michigan, Chicago

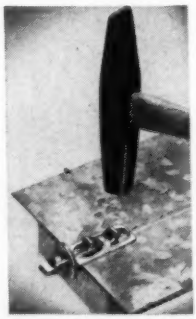
ABC AIR CONDITIONING HEADQUARTERS ABP

NEW YORK: 1734 Grand Central Terminal CLEVELAND: 737 National City Bank Bldg. LOS ANGELES: 612 S. Lafayette Park Place

# How to Build Heating and Cooling Profits With E-Z-ON Damper Regulators

**Here are practical pointers on how the use of E-Z-ONS cut installation time, eliminate extra work and make it possible to handle a greater volume of business . . . with increased profits.**

**The E-Z-ON damper regulators have a newly designed Automatic Slot Opener that permits instant assembly of the regulator to the damper. The regulator is simply positioned on the damper by sliding it over the scribed center line. E-Z-ONS accurately stay in position until a hammer blow drives the sharp prongs through the damper. If a Gerett anvil is used the clinching is automatic.**



**Advanced design of E-Z-ON damper regulators permits on-the-job assembly with only a hammer—no drilling—no rivets. E-Z-ONS streamlined design gives greater satisfaction because they avoid three major causes of noise, rattly rivets, loose holes and obstructed air flow. Job histories prove that your apprentice or journeyman can save two-thirds of their time in making up dampers with E-Z-ONS.**

### E-Z-ONS IDEAL FOR AIR CONDITIONING

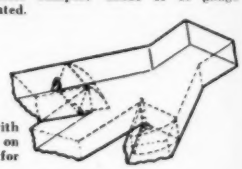
**Recent surveys reveal that the coming year will be the biggest in residential air conditioning. Here again, E-Z-ONS can give you a competitive jump. With the indicating handle, E-Z-ONS permit simple damper changing from winter to summer settings. In high velocity systems E-Z-ON Regulators can be used on dampers as small as 3¼" dia. or the head piece only can be used if desired. E-Z-ON regulators work equally well on round or rectangular volume and splitter type dampers.**

### FAMOUS E-Z-ON STANDARD DESIGN No. 27

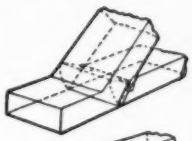
**⅜" bearing, dozen to a box, lists at $3.48 Consists of: solid end tail piece, threaded head piece and wing nut. Made of 16 gauge steel and heavily zinc plated, E-Z-ON prongs are strong enough to pierce 22 gauge metal.**

### SUPERIOR E-Z-ON "SNAP-TITE" DESIGN No. 29

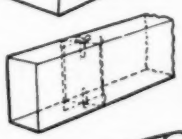
**⅜" bearing, dozen to a box, lists at $4.20 and has tail piece with retractable snap end bearing, threaded head piece and wing nut. This eliminates need to bend damper or spring duct to insert damper. Made of 16 gauge steel, heavily zinc plated.**



**Dampers installed with E-Z-ON Regulators on one side or edge for branch ducts.**



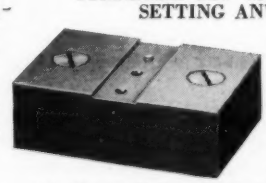
**Slitter Damper attached at edge with E-Z-ON Damper Regulator.**



**Volume Damper, with E-Z-ON centered at each end.**

**E-Z-ON Damper Regulator fastened to small damper with headpiece only.**

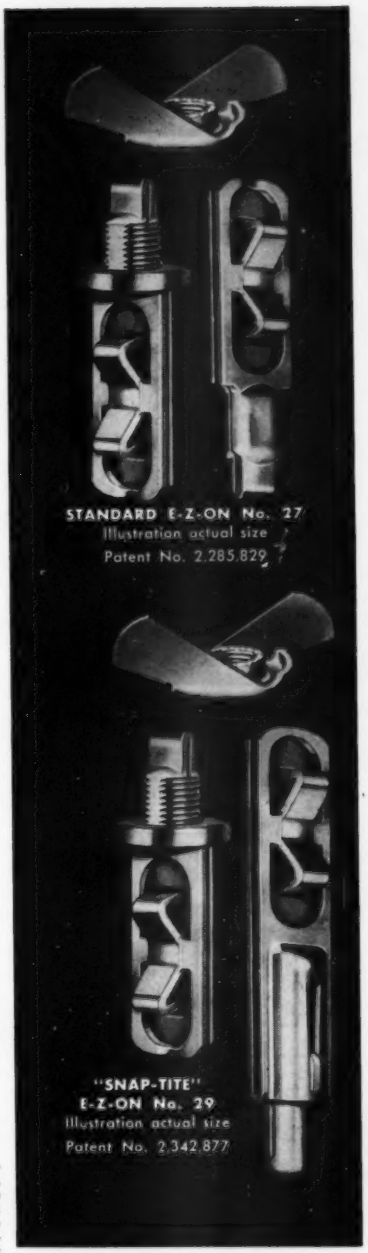
### STANDARD and "SNAP-TITE" SETTING ANVIL

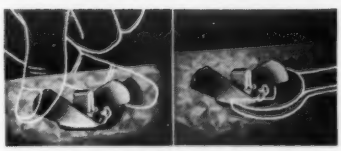


**Saves time assembling regulators, operating on the principle of a rivet set. Can also be used in kick or power press. Completely sets and fastens a unit in one operation. Of hardened steel. Weight 1¾ lbs., size 1" thick, 2" wide, 3" long — complete with fastening screws. Lists at $2.80 each.**

### INDICATOR HANDLE

**No. 26 Indicator Handle, lists at 40c per dozen. Ideal for systems that use same ducts for heating and cooling because it clearly shows damper position . . . can be turned to summer or winter setting. Made of 19 gauge steel, heavily zinc plated. Small slot in end allows use as a tool to engage tongue of regulator in place of pliers.**



**USE FINGERS or WRENCH**

**Fine S.A.E. type thread together with the large clamping surface on the wing nut assures positive damper locking.**

***E-Z-ONS . . . built for speed and profits***

## M. A. GERETT CORP.

**724 WINNEBAGO STREET, MILWAUKEE 5, WIS.**

# Housing Census Heating Data

## Altoona, Pa. • El Paso • Miami, Fla. • New Bedford, Mass. • San Francisco

SUGGESTIONS on how a warm air heating dealer can use some of the housing data available from the Bureau of Census were given in the November 1954 American Artisan. Localities covered in the reports are metropolitan areas that are socially and economically integrated with the central city. Data for various areas has been reported regularly in American Artisan since May 1953. Additional reports will continue to appear regularly.

### Types of Fuel Used in Centrally Heated Dwelling Units

| | Standard Metropolitan Areas | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Altoona, Pa. | El Paso, Tex. | Miami, Fla. | New Bedford, Mass. | San Francisco, Calif. | | | | | | |
| | Blair County | El Paso County | Dade County | Bristol County (Part) | The Area | Alameda County | Contra Costa County | Marin County | San Francisco County | San Mateo County | Solano County |
| All dwelling units | 40,941 | 50,794 | 180,658 | 43,241 | 741,668 | 247,145 | 90,641 | 28,598 | 265,726 | 76,551 | 33,007 |
| Number reporting heating equipment | 39,710 | 46,300 | 150,460 | 41,270 | 698,595 | 236,440 | 82,740 | 24,755 | 253,855 | 70,695 | 30,110 |
| Central heating | 32,835 | 13,385 | 5,020 | 16,150 | 431,195 | 138,750 | 48,330 | 15,160 | 161,245 | 54,815 | 12,895 |
| Coal | 26,005 | 135 | 370 | 4,855 | 4,405 | 1,200 | 235 | 90 | 2,475 | 280 | 125 |
| Wood | 95 | 45 | 165 | 95 | 1,660 | 585 | 110 | 55 | 670 | 155 | 85 |
| Utility gas | 5,915 | 12,500 | 1,450 | 1,520 | 396,225 | 128,595 | 40,055 | 12,890 | 150,355 | 52,745 | 11,585 |
| Bottled gas | 90 | 75 | 505 | 65 | 2,425 | 560 | 480 | 260 | 635 | 290 | 200 |
| Liquid fuel | 470 | 245 | 435 | 9,445 | 15,595 | 4,210 | 6,465 | 1,570 | 2,280 | 525 | 545 |
| Other fuel | 165 | 315 | 1,280 | 90 | 8,005 | 3,015 | 835 | 275 | 2,995 | 635 | 250 |
| Not reporting | 95 | 70 | 815 | 80 | 2,880 | 585 | 150 | 20 | 1,835 | 185 | 105 |

### Types of Nonfarm Dwelling Units, by Type of Heating and Year Built

| | Total occupied | | | | | | Owner occupied | | | Renter occupied | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total | 1 dwelling unit, detached | Other 1, and 2 dwelling unit | 3 and 4 dwelling unit | 5 to 9 dwelling unit | 10 dwelling unit or more | Total | 1 dwelling unit, detached | All other dwelling units | Total | 1 dwelling unit, detached | Other 1, and 2 dwelling unit | 3 and 4 dwelling unit | 5 to 9 dwelling unit | 10 dwelling unit or more |
| **Standard Metropolitan Area of Altoona, Pa. — Blair County** | | | | | | | | | | | | | | | |
| All occupied units | 37,005 | 25,830 | 7,250 | 2,355 | 1,120 | 450 | 23,900 | 20,920 | 2,980 | 13,105 | 4,910 | 4,725 | 1,995 | 1,075 | 400 |
| HEATING EQUIPMENT | | | | | | | | | | | | | | | |
| Central heating | 31,379 | 21,986 | 6,136 | 1,966 | 995 | 296 | 21,238 | 18,604 | 2,634 | 10,141 | 3,382 | 3,889 | 1,666 | 949 | 255 |
| Piped steam or hot water | 12,163 | 7,615 | 2,264 | 1,256 | 740 | 288 | 7,550 | 6,524 | 1,026 | 4,613 | 1,091 | 1,494 | 1,056 | 717 | 255 |
| Warm air furnace | 19,216 | 14,371 | 3,872 | 710 | 255 | 8 | 13,688 | 12,080 | 1,608 | 5,528 | 2,291 | 2,395 | 610 | 232 | ... |
| Noncentral heating, with flue | 4,621 | 3,288 | 895 | 318 | 84 | 36 | 2,231 | 1,957 | 274 | 2,390 | 1,331 | 681 | 258 | 84 | 56 |
| Nonctrl. htng., without flue; or not htd. | 717 | 400 | 153 | 70 | 21 | 73 | 268 | 247 | 21 | 449 | 153 | 132 | 70 | 21 | 73 |
| Not reported | 286 | 156 | 65 | ... | 21 | 44 | 163 | 112 | 51 | 123 | 44 | 22 | ... | 21 | 36 |
| YEAR BUILT | | | | | | | | | | | | | | | |
| 1945 or later | 2,061 | 1,857 | 27 | 177 | ... | ... | 1,581 | 1,581 | ... | 480 | 276 | 27 | 177 | ... | ... |
| 1940 to 1944 | 471 | 444 | 27 | ... | ... | ... | 416 | 416 | ... | 55 | 28 | 27 | ... | ... | ... |
| 1939 or earlier | 34,100 | 23,362 | 7,170 | 2,155 | 1,013 | 400 | 21,713 | 18,783 | 2,930 | 12,387 | 4,579 | 4,645 | 1,795 | 968 | 400 |
| Not reported | 324 | 167 | 27 | 22 | 108 | ... | 139 | 139 | ... | 185 | 28 | 27 | 22 | 108 | ... |
| **Standard Metropolitan Area of El Paso, Tex. — El Paso County** | | | | | | | | | | | | | | | |
| All occupied units | 45,525 | 24,860 | 7,200 | 3,870 | 4,345 | 5,250 | 20,555 | 17,530 | 3,025 | 24,970 | 7,330 | 5,155 | 3,325 | 4,065 | 5,095 |
| HEATING EQUIPMENT | | | | | | | | | | | | | | | |
| Central heating | 13,294 | 8,835 | 1,449 | 967 | 743 | 1,300 | 7,966 | 7,317 | 649 | 5,328 | 1,518 | 1,040 | 846 | 650 | 1,274 |
| Piped steam or hot water | 3,873 | 1,188 | 364 | 721 | 498 | 1,102 | 921 | 695 | 226 | 2,952 | 493 | 266 | 681 | 436 | 1,076 |
| Warm air furnace | 9,421 | 7,647 | 1,085 | 246 | 245 | 198 | 7,045 | 6,622 | 423 | 2,376 | 1,025 | 774 | 165 | 214 | 198 |
| Noncentral heating, with flue | 12,350 | 7,005 | 1,877 | 1,194 | 1,163 | 1,111 | 5,543 | 4,700 | 843 | 6,807 | 2,305 | 1,239 | 1,033 | 1,132 | 1,098 |
| Nonctrl. htng., without flue; or not htd. | 18,030 | 8,201 | 3,544 | 1,502 | 2,334 | 2,449 | 6,456 | 5,048 | 1,408 | 11,574 | 3,153 | 2,611 | 1,260 | 2,178 | 2,372 |
| Not reported | 1,852 | 818 | 331 | 206 | 107 | 390 | 587 | 463 | 124 | 1,265 | 355 | 266 | 186 | 107 | 351 |
| YEAR BUILT | | | | | | | | | | | | | | | |
| 1945 or later | 9,160 | 7,290 | 928 | 683 | 160 | 99 | 6,092 | 5,652 | 440 | 3,068 | 1,638 | 513 | 658 | 160 | 99 |
| 1940 to 1944 | 2,847 | 2,094 | 302 | ... | 451 | ... | 1,755 | 1,584 | 171 | 1,092 | 510 | 154 | ... | 428 | ... |
| 1939 or earlier | 31,068 | 14,392 | 5,547 | 2,932 | 3,423 | 4,774 | 11,769 | 9,693 | 2,076 | 19,299 | 4,699 | 4,154 | 2,436 | 3,236 | 4,774 |
| Not reported | 2,295 | 1,084 | 422 | 255 | 311 | 223 | 785 | 601 | 184 | 1,510 | 483 | 333 | 230 | 241 | 223 |

(*Continued on page 104*)

**More than 6000 lbs.** of Monel Roofing Sheet were used on the modern new Statler Hilton Hotel, Dallas, Texas. No problems in using Monel Roofing Sheet . . . either in the shop or on the job. Metal Sheet Contractor: Lydick Roofing Co., Dallas, Texas.

# If you never used MONEL before take a minute to read this...

Monel roofing jobs are *plentiful*. They are *profitable*. They are *easy to install*.

There's no time like the present to learn about using Monel* Roofing Sheet. For more and more architects are specifying it.

Here are the facts.

Monel nickel-copper alloy is strong. Tough. Yet it has a special roofing temper . . . a temper that makes it easy to work. On your present equipment, you can form it into intricate shapes... even make it bend 180° . . . without cracking.

You pre-tin the sheets in the shop to be sure of tight joints. And by using a heavy, hot soldering iron you get perfect seams every time.

Think of all the jobs that call for Monel nickel-copper alloy! Churches. Hotels. Hospitals. Schools. City buildings. Even some private homes.

So don't pass up those profitable Monel roofing jobs. Be prepared to quote accurately.

For all the information you need to do a job you'll be proud of, write for these free booklets. "Instructions for the Soft Soldering of Monel Roofing Sheet" and "Basic Application Data — Monel Roofing Sheet." Just send a post card for "Roofers' Bulletins."

*Registered Trademark

**The International Nickel Company, Inc.**
67 Wall Street New York 5, N.Y.

INCO TRADE MARK

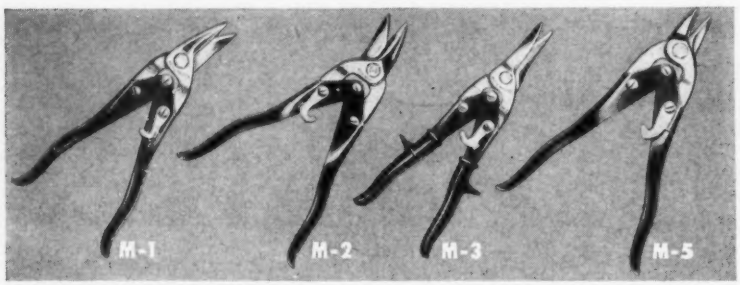
**Monel Roofing Sheet** was used in the Dallas Statler Hilton Hotel for architectural louvers, flashings and other exposed sheet metal.

50 YEARS OF *Nickel Alloy Progress* PIONEERED BY MONEL 1905 - 1955

## Monel Roofing . . . *"for the life of the building"*

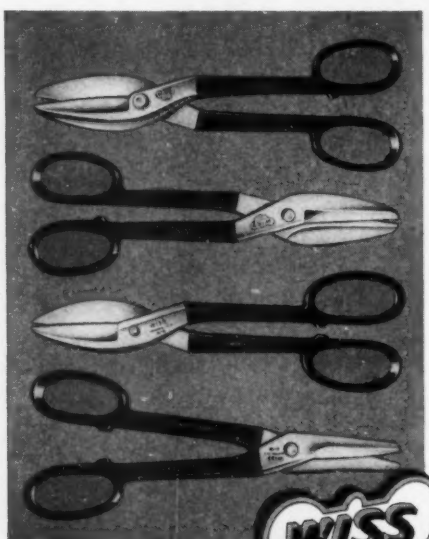
# "WE FEATURE WISS SNIPS BECAUSE OF THEIR HIGH QUALITY AND WIDE CONSUMER ACCEPTANCE"

*J. G. Younggren of the San Antonio Machine & Supply Co., San Antonio, agrees with other distributors of Wiss metal cutting snips. There are several reasons why they are the choice of professional workers everywhere—why they sell better, with fewer returns. Wiss snips are produced largely by the hand-work of skilled workers. Each pair is rigidly tested and guaranteed perfect. Bolts are set precisely to reduce wear and to increase cutting power with the least effort.*




**WISS METAL MASTER SNIPS:** Compound action design delivers amazing cutting power. These 10" snips cut with about one-half the effort required for standard 12½" snips. One edge serrated to prevent slipping. M-1 (cuts left) and M-2 (cuts right) are designed to cut the most intricate scrolls and circles. M-3 is for shallow arcs and straight cutting. M-5 Bulldog Heavy Duty snips are tops for notching, nibbling and cutting shallow arcs in sheet metal as heavy as 16 gauge.
**Now available with comfortable vinyl grips in identifying colors.**

Wiss inlaid blades are made of high carbon crucible steel welded to a hot drop-forged frame to provide the extra service demanded by professional workers.



**WISS INLAID SNIPS**
High carbon crucible steel welded to a hot drop-forged frame provides that *extra* service demanded by professional users everywhere. Six Straight Cutting sizes from 11½" to 17", including Bulldog Snips for notching. Three Combination* Cutting sizes, 12½", 13½" and 14½".

**WISS SOLID STEEL SNIPS**
For those whose requirements are less specialized than the professional user. Hot drop-forged of fine carbon steel, they meet or exceed government specifications. Four straight cutting sizes, 8" to 12½". Four Combination* Cutting sizes, 7", 10", 13" and 16" Bulldog Snips for notching.

*Made with straight blades, but ground and shaped so they readily cut curves and irregular shapes as well as straight.

Wiss snips are hot drop-forged of the finest steels available.

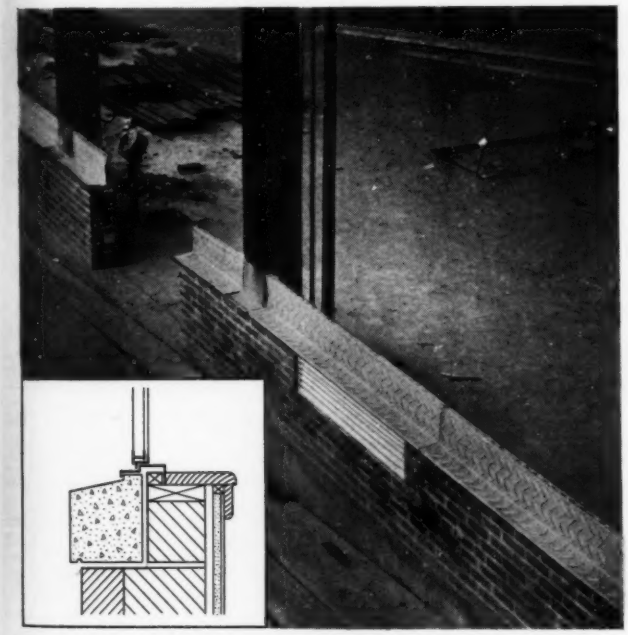
Highly skilled craftsmen make final adjustments to assure that Wiss snips will cut perfectly for a long time.

**J. WISS & SONS CO., NEWARK 7, NEW JERSEY**

*Manufacturers of Shears, Scissors, Pinking Shears, Metal Cutting Snips and Garden Shears*

# Another new school protected by Anaconda Through-Wall Flashing

THE NEW SOUTH JUNIOR HIGH SCHOOL, BROCKTON, MASSACHUSETTS
**Architect:** Edmund I. Leeds & Associates, Allston, Mass. **Sheet Metal Contractor:** Gilbert & Becker, Dorchester, Mass. **Distributor:** Brown-Wales Company, Cambridge, Mass.



This photo taken during construction of the new South Junior High School shows Anaconda Through-Wall Flashing set in place for continuous protection at window sill level. **Insert:** Cross section view through wall showing location of Through-Wall Flashing at sill level.

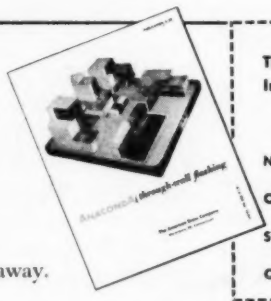
## Here's why the Anaconda Flashing is preferred:

**EFFICIENT DESIGN:** The embossed zigzag corrugations give thorough bond in the mortar and equal resistance to lateral movement in all directions. The precision-stamped dam and corrugations are integral and of equal height. The smooth, flat selvage can be easily bent to form a counter flashing without causing humps or ridges that would prevent free drainage.

**POSITIVE PROTECTION:** In parapet construction, the Anaconda Flashing is installed so that the tongue edge of the dam is within ¼" of the outside face of the wall giving maximum protection against moisture infiltration. There is still sufficient bed for pointing the joint. The integral stamped dam and corrugations prevent accumulated water flowing lengthwise of the flashing and re-entering the masonry at the lap joints.

**EASY INSTALLATION:** The Anaconda Through-Wall Flashing is installed easily and quickly, with a minimum of delay to bricklayers and masons. Tight end joints can be made by overlapping one or two corrugations. The smooth selvage is easily bent or cut on the job to accurately fit the construction. Machine-stamped corner pieces for both 8" and 12" walls are available and make a neat, workmanlike job. Soldered miter joints or bulky laps are eliminated.

ANACONDA® SHEET COPPER



**FREE:** This new publication, with its clear, detailed illustrations, shows you how you can provide the complete protection of Anaconda Through-Wall Flashing. Send in the coupon for your FREE copy right away.

**The American Brass Company, Waterbury 20, Conn.**
**In Canada: Anaconda American Brass, Ltd., New Toronto, Ont.**

Please send me my copy of Publication C-28

NAME.....

COMPANY.....

STREET.....

CITY.....ZONE.....STATE.....

# Housing Census Heating Data

(*Continued from page* 100)

## Types of Nonfarm Dwelling Units, by Type of Heating and Year Built

| | Total occupied | | | | | | Owner occupied | | | Renter occupied | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Total | 1 dwelling unit, detached | Other 1, and 2 dwelling unit | 3 and 4 dwelling unit | 5 to 9 dwelling unit | 10 dwelling unit or more | Total | 1 dwelling unit, detached | All other dwelling units | Total | 1 dwelling unit, detached | Other 1, and 2 dwelling unit | 3 and 4 dwelling unit | 5 to 9 dwelling unit | 10 dwelling unit or more |
| **Standard Metropolitan Area of Miami, Fla. — Dade County** | | | | | | | | | | | | | | | |
| All occupied units | 151,725 | 97,735 | 18,945 | 10,785 | 8,845 | 15,415 | 81,875 | 73,925 | 7,950 | 69,850 | 23,810 | 13,675 | 9,370 | 8,190 | 14,805 |
| HEATING EQUIPMENT | | | | | | | | | | | | | | | |
| Central heating | 5,107 | 2,845 | 565 | 301 | 486 | 910 | 2,779 | 2,412 | 367 | 2,328 | 433 | 397 | 276 | 420 | 802 |
| Piped steam or hot water | 4,376 | 2,332 | 502 | 280 | 446 | 816 | 2,218 | 1,942 | 276 | 2,158 | 390 | 353 | 255 | 380 | 780 |
| Warm air furnace | 731 | 513 | 63 | 21 | 40 | 94 | 561 | 470 | 91 | 170 | 43 | 44 | 21 | 40 | 22 |
| Noncentral heating, with flue | 14,067 | 11,555 | 1,198 | 390 | 176 | 748 | 10,215 | 9,648 | 567 | 3,852 | 1,907 | 751 | 340 | 160 | 694 |
| Nonctrl. htng., without flue; or not htd. | 127,902 | 79,879 | 16,712 | 9,963 | 8,006 | 13,342 | 66,005 | 59,211 | 6,794 | 61,897 | 20,668 | 12,150 | 8,647 | 7,449 | 12,983 |
| Not reported | 4,640 | 3,449 | 469 | 131 | 176 | 415 | 2,871 | 2,647 | 224 | 1,769 | 802 | 376 | 106 | 160 | 325 |
| YEAR BUILT | | | | | | | | | | | | | | | |
| 1945 or later | 51,364 | 35,607 | 6,329 | 2,313 | 2,693 | 4,422 | 33,903 | 31,492 | 2,411 | 17,461 | 4,115 | 4,449 | 2,065 | 2,579 | 4,253 |
| 1940 to 1944 | 15,932 | 11,304 | 1,911 | 1,057 | 596 | 1,064 | 10,255 | 9,481 | 774 | 5,677 | 1,823 | 1,284 | 1,007 | 567 | 996 |
| 1939 or earlier | 77,883 | 46,743 | 9,815 | 6,849 | 5,160 | 9,316 | 35,026 | 30,558 | 4,468 | 42,857 | 16,185 | 7,166 | 5,757 | 4,704 | 9,045 |
| Not reported | 6,543 | 4,076 | 890 | 567 | 397 | 613 | 2,689 | 2,391 | 298 | 3,854 | 1,685 | 776 | 542 | 340 | 511 |
| **Standard Metropolitan Area of New Bedford, Mass. — Bristol County (Part)** | | | | | | | | | | | | | | | |
| All occupied units | 38,840 | 12,175 | 9,965 | 11,720 | 4,150 | 830 | 15,820 | 10,105 | 5,715 | 23,020 | 2,070 | 6,290 | 9,905 | 3,960 | 795 |
| HEATING EQUIPMENT | | | | | | | | | | | | | | | |
| Central heating | 15,060 | 8,068 | 3,835 | 1,690 | 786 | 681 | 9,621 | 7,114 | 2,507 | 5,439 | 954 | 1,943 | 1,159 | 702 | 681 |
| Piped steam or hot water | 11,217 | 5,249 | 3,233 | 1,367 | 687 | 681 | 6,884 | 4,681 | 2,203 | 4,333 | 568 | 1,580 | 880 | 624 | 681 |
| Warm air furnace | 3,843 | 2,819 | 602 | 323 | 99 | ... | 2,737 | 2,433 | 304 | 1,106 | 386 | 363 | 279 | 78 | ... |
| Noncentral heating, with flue | 22,204 | 3,790 | 5,774 | 9,379 | 3,129 | 132 | 5,752 | 2,735 | 3,017 | 16,452 | 1,055 | 4,121 | 8,139 | 3,023 | 114 |
| Nonctrl. htng., without flue; or not htd. | 1,286 | 270 | 236 | 585 | 195 | ... | 340 | 209 | 131 | 946 | 61 | 149 | 541 | 195 | ... |
| Not reported | 295 | 46 | 128 | 64 | 39 | 18 | 107 | 46 | 61 | 188 | ... | 85 | 64 | 39 | ... |
| YEAR BUILT | | | | | | | | | | | | | | | |
| 1945 or later | 1,289 | 1,176 | 57 | 29 | 27 | ... | 1,108 | 1,080 | 28 | 181 | 96 | 29 | 29 | 27 | ... |
| 1940 to 1944 | 752 | 386 | 29 | ... | 106 | 231 | 386 | 386 | ... | 366 | ... | 29 | ... | 106 | 231 |
| 1939 or earlier | 36,474 | 10,513 | 9,830 | 11,603 | 3,964 | 564 | 14,239 | 8,587 | 5,652 | 22,235 | 1,926 | 6,183 | 9,788 | 3,774 | 564 |
| Not reported | 297 | 99 | 57 | 88 | 53 | ... | 51 | 51 | ... | 246 | 48 | 57 | 88 | 53 | ... |
| **Standard Metropolitan Area of San Francisco — Oakland, Calif. — Alameda, Contra Costa, Marin, San Francisco, San Mateo and Solano Counties** | | | | | | | | | | | | | | | |
| All occupied units | 684,850 | 344,625 | 114,675 | 62,855 | 68,040 | 94,655 | 332,330 | 274,385 | 57,945 | 352,520 | 70,240 | 71,380 | 53,640 | 64,640 | 92,620 |
| HEATING EQUIPMENT | | | | | | | | | | | | | | | |
| Central heating | 419,170 | 234,599 | 59,907 | 24,198 | 27,844 | 72,622 | 238,325 | 202,693 | 35,632 | 180,845 | 31,906 | 31,340 | 20,008 | 26,358 | 71,233 |
| Piped steam or hot water | 112,870 | 18,349 | 10,889 | 7,520 | 15,849 | 60,263 | 20,839 | 14,293 | 6,546 | 92,031 | 4,056 | 7,278 | 6,445 | 14,926 | 59,326 |
| Warm air furnace | 306,300 | 216,250 | 49,018 | 16,678 | 11,995 | 12,359 | 217,486 | 188,400 | 29,086 | 88,814 | 27,850 | 24,062 | 13,563 | 11,432 | 11,907 |
| Noncentral heating, with flue | 195,103 | 86,087 | 41,145 | 28,035 | 28,253 | 11,583 | 74,569 | 57,998 | 16,571 | 120,534 | 28,089 | 30,204 | 24,239 | 26,790 | 11,212 |
| Nonctrl. htng., without flue; or not htd. | 57,734 | 18,497 | 11,469 | 8,929 | 10,343 | 8,496 | 14,434 | 10,190 | 4,244 | 43,300 | 8,307 | 8,589 | 7,942 | 10,095 | 8,367 |
| Not reported | 12,837 | 5,431 | 2,149 | 1,695 | 1,605 | 1,957 | 4,993 | 3,501 | 1,492 | 7,844 | 1,930 | 1,246 | 1,454 | 1,402 | 1,812 |
| YEAR BUILT | | | | | | | | | | | | | | | |
| 1945 or later | 88,134 | 67,094 | 12,299 | 3,431 | 2,944 | 2,366 | 66,418 | 59,838 | 6,580 | 21,716 | 7,256 | 6,177 | 3,135 | 2,870 | 2,278 |
| 1940 to 1944 | 107,460 | 52,375 | 16,222 | 5,767 | 20,106 | 12,990 | 49,312 | 44,248 | 5,064 | 58,148 | 8,127 | 11,555 | 5,606 | 19,958 | 12,902 |
| 1939 or earlier | 468,109 | 217,483 | 82,430 | 51,081 | 42,011 | 75,104 | 210,365 | 165,742 | 44,623 | 257,744 | 51,741 | 50,774 | 42,565 | 39,153 | 73,511 |
| Not reported | 21,144 | 7,668 | 3,727 | 2,580 | 2,979 | 4,190 | 6,233 | 4,555 | 1,678 | 14,911 | 3,113 | 2,876 | 2,338 | 2,659 | 3,925 |

## THIS INFORMATION COMES TO YOU . . .

. . . from statistics compiled by the Bureau of the Census and is extracted from the overall housing picture to supply the heating dealer with useful facts which tell the heating story from the standpoint of market possibilities in his immediate area. The series, which began in the May, 1953 American Artisan and will be concluded in March, 1956, covers 152 standard metropolitan areas. Defined by the Census Bureau as including a county or group of contiguous counties which contains at least one city of 50,000 inhabitants or more, a metropolitan area could also be described as a marketing area. All localities qualified by the definition are covered in this series of tables and represent a complete picture of the nation's market centers.

Tear sheets for any locality are available from our editorial offices on request.

# Greetings

TO ALL H & C CUSTOMERS

*Your friendship and patronage during the past year is greatly appreciated. We consider it a privilege to have served you and say "THANKS A MILLION" — We extend to you our very best wishes for*

## a Merry Christmas

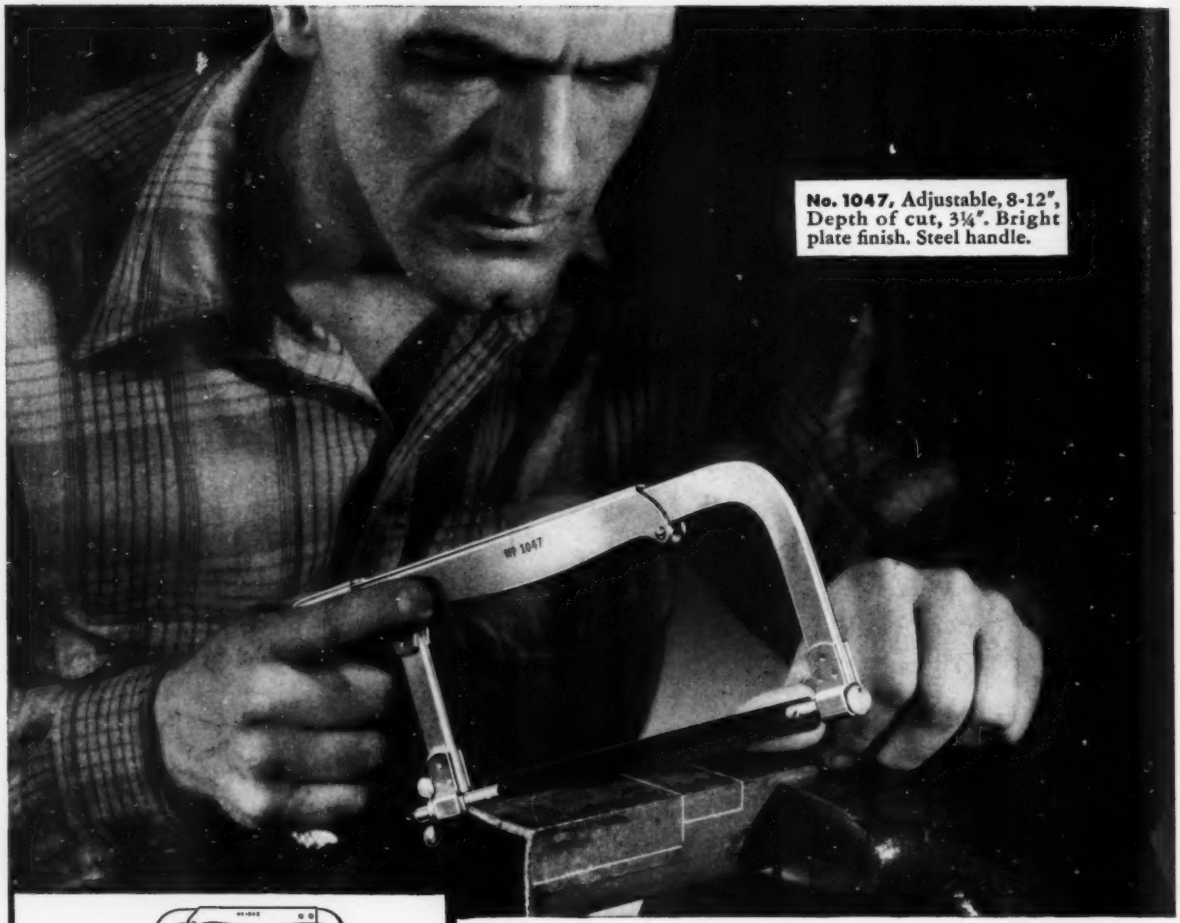
AND

## Prosperous New Year

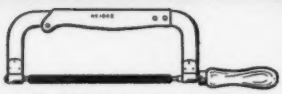
HART & COOLEY MANUFACTURING CO.

HOLLAND, MICHIGAN

THE WORLD'S LARGEST AND MOST PROGRESSIVE PRODUCERS OF REGISTERS AND GRILLES




**No. 1042**



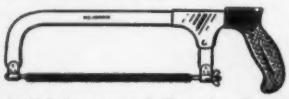
Adjustable, 8-12". Depth of cut, 2½". Bright plate finish. Wood handle.

**No. 1046**

Adjustable, 8-12". Depth of cut, 2½". Bright plate finish. Steel handle.

**No. 1049**

Adjustable, 8-12". Depth of cut, 3¼". Bright plate finish. Neoprene handle.



**No. 1044N**

Solid frame, 12". Depth of cut, 3¼". Bright plate finish. Neoprene handle. Also No. 1044 with steel handle.

# CRESCENT HACKSAWS

● Strong, rigid, well-balanced Crescent Hacksaws are designed for the exacting mechanic. Choose from five popular patterns having wood, steel or Neoprene handles. The Neoprene handles are far superior to plastic. They are impervious to oil and acid, unaffected by extremes of heat or cold, have high dielectric value and are practically unbreakable. Sold by Industrial Distributors and Hardware Dealers everywhere.

**CRESCENT TOOLS**
*Give Wings to Work* ®
*Sign of the Artisan*
*Symbol of Excellence*

Crescent is our trade-mark, registered in the United States and abroad, for wrenches and other tools. Sold by leading distributors and retailers everywhere and made only by

**CRESCENT TOOL COMPANY, JAMESTOWN, NEW YORK**

# NOW!

## HANDIEST WAY TO BUY AND STORE 16 OZ. ROOFING COPPER!
## CHASE ROLL COPPER IN CARTONS!

**PROTECTS CONTENTS FROM DAMAGE** Edges of coil kept free from dents. Surface of coil remains unmarred. Coils *stay* round!

**NO ACCIDENTAL UNWINDING**

**SIMPLIFIES INVENTORY** B-I-G lettering on label quickly gives you all information needed to identify contents.

**EASILY STORED** Container is extremely compact.

**TOP QUALITY ROOFING COPPER, TRADEMARKED BY CHASE** You know *this* 16 oz. copper is clean, bright, perfect.

**SAFE EASY HANDLING** Recessed ends protect fingers. Cylindrical shape can be rolled or lifted easily.

**ALL STANDARD WIDTHS AVAILABLE** The Chase warehouse near you stocks containers of Chase 16 oz. roofing copper. Available either in standard 500 lb. crates, or on 2000 lb. skids from the mill.

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**BRASS & COPPER CO.**

**WATERBURY 20, CONNECTICUT • SUBSIDIARY OF KENNECOTT COPPER CORPORATION**

*The Nation's Headquarters for Brass & Copper*

Atlanta Baltimore Boston Charlotte Chicago Cincinnati Cleveland Dallas Denver Detroit Grand Rapids Houston Indianapolis Kansas City, Mo. Los Angeles Milwaukee Minneapolis Newark New Orleans New York Philadelphia Pittsburgh Providence Rochester St. Louis San Francisco Seattle Waterbury

YOU AND THE LAW

# Can Dealer Recover Collection Charges?

**Usually the customer will have to pay collection and attorneys' fees if he defaults and suit is brought for recovery — if the amount specified for these charges in the promissory note is reasonable**

A RECENT DECISION by a court of one of the eastern states sets out the circumstances surrounding collection of a promissory note by a bank, that should be of both interest and value to any air conditioning or warm air heating dealer selling by any other method than cash.

### Note Includes Collection Fees

This note provided that the maker would pay to a construction company $708.12 in 36 equal installments and that if any installment was not paid when due the entire balance at the option of the holder should immediately become due, together with 18 percent of the unpaid balance, for collection expense and attorney's fees.

After the note had been assigned to a bank the maker failed to pay the agreed installments and suit was brought for the unpaid balance of $570.43 plus the stipulated 18 percent. Only 5 percent was allowed by the lower court for the collection expenses and the bank appealed. In its comment on this feature the appellate court said:

### Find Provisions Valid

"Counsel for the bank protests that however gracious and benevolent may have been the purpose of the trial judge the lawful rights of an acknowledged bona fide holder of a valid and negotiable instrument were prejudicially offended. We have no doubt of it. The action is remanded with instructions to enter judgment for the balance of the unpaid principle and the attorney's fees therein specified."

When suit was brought a few years ago by the U.S. Government on notes held by the Federal Housing Administration, the lower court refused to permit the government to recover the collection costs under a provision that, "The maker or makers further agree that if this note or any installment thereof is not paid at its maturity, to pay all costs of collection including the cost of suit and 15 percent of the amount in default as attorney's fees."

### Ascertain 'Reasonable Value'

From that decision the U.S. Government appealed and in reversing the judgment the appellate court said:

"The validity of stipulations in promissory notes for the payment of attorney's fees in the event of default is supported by the weight of decisions in the state and federal courts.

"Such provisions however, are sustained only as an indemnity for the reasonable fees necessarily and properly paid or incurred. The question of what constitutes a reasonable fee depends upon the circumstances of each case. If the court deems it necessary or if either party desires, testimony may be taken as to the nature of the services rendered and the reasonable value thereof."

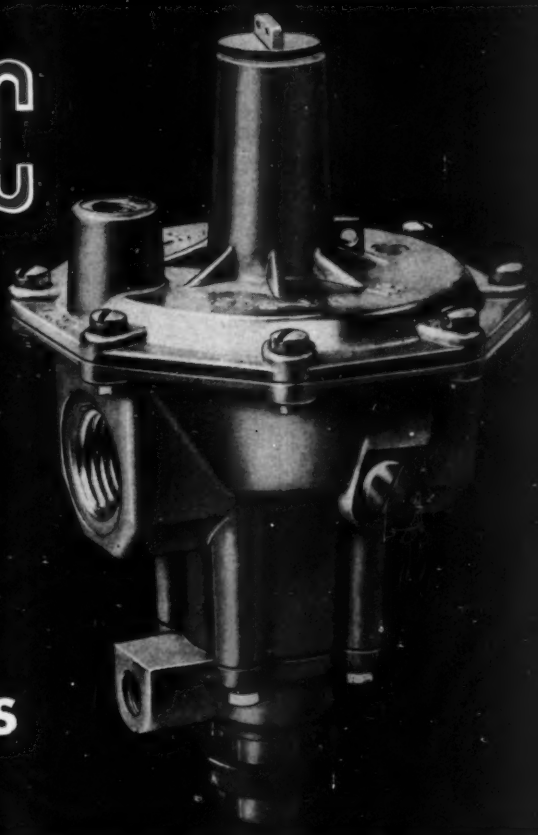
### Factors Determine Validity

Another Federal court decision outlined three features essential to the validity of this method for minimizing the loss that is inevitable when a dealer or contractor must collect unpaid accounts.

"In the light of these decisions and the overwhelming weight of authority in the state courts we hold the rule to be 1) that a provision in a promissory note for the payment of attorney's fees for services actually rendered in collection is not to be condemned as contrary to public policy if reasonable in amount and not used as a cloak for usury or other forbidden transactions; 2) that such a provision is enforced as a contract of indemnity and the amount stipulated therein is not absolutely binding on the parties or the court but will be enforced to the extent that it provides for a reasonable attorney's fee for services actually rendered in accordance with its terms; and 3) that where services have been rendered and the amount stipulated is obviously not excessive, the stipulation as to the amount should govern."

*[Note: While this discussion applies to actual cases, it should be remembered that legal rules vary in different states.]*

# THERMAC



*Finest*
**GAS CONTROLS**

**What the name THERMAC on a gas control means to you . . .**

Undivided attention to the specialty of producing gas controls has resulted in a number of basic and substantial design features around which our present products are built.

Concentration too, in manufacturing and production methods is also vitally important. In our own modern plant we do the entire job from Engineering and Research to Assembly and Final Testing — no one else is entrusted with this responsibility. Therefore, the controls you buy today are the result of 24 years of highly concentrated effort in research and in manufacturing techniques. Our volume production methods are your assurance of low cost.

Sound engineering, expert manufacturing, low cost and prompt delivery — that's what the name Thermac means to American Appliance Builders.

SEND FOR ILLUSTRATED CATALOG

*24 YEARS' EXPERIENCE BUILDING GAS CONTROLS*

THERMAC

*Service is our job — on the spot engineering assistance and immediate delivery.*

HM COMPANY 800 East 108th Street • Los Angeles 59, California

# SETTING THE PACE
## IS TRADITIONAL WITH COPELAND

'Way back when we first announced the COPELAMETIC, its potential was recognized quickly by refrigeration people. The original "accessible hermetic" enjoyed immediate acceptance, because it filled a practical need. We're complimented that it "sets the pace" for others to follow.

Basic ingredient for engineering progress is to know what's needed. Copeland has done that by working closely with manufacturers, dealers and users. We've lived with your problems. We're convinced that it pays off for everyone.

### Now, Suction Cooling Extends Range of Air-Cooled Units for Air Conditioning

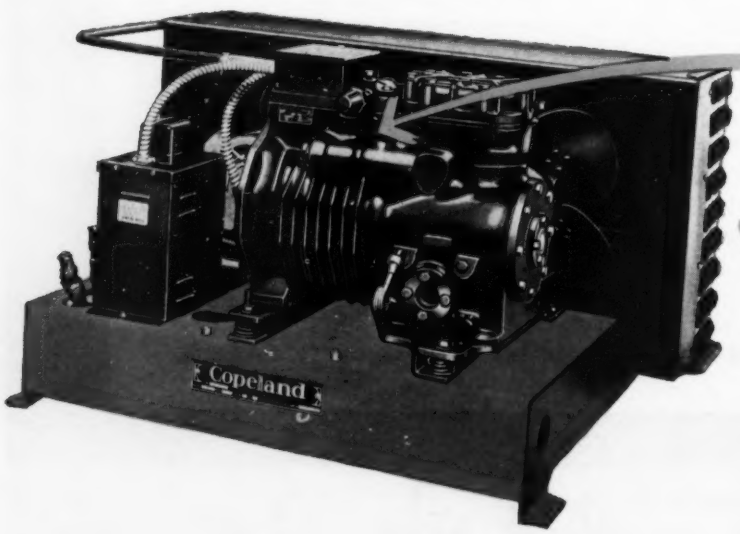
One of the frequent problems in the rapidly expanding, central air conditioning market has been water requirements. At Copeland we met this difficulty head on, and our answer is in condensing units with suction-cooled motor-compressors in sizes through 5 H.P.

The Copelametic line includes a range of smaller size units using the principle of suction cooling. They afford greater flexibility of installation, since no water is needed. Now the larger sizes make possible even wider applications.

The new 2, 3 and 5 H.P. suction-cooled Copelametics are designed especially for air conditioning and other high suction pressure installations. Oversize, finned-tube condensers on these models insure maximum efficiency in high ambient temperatures.

New specification sheets on Copelametic suction-cooled motor-compressors and condensing units give all the facts. Send for your copies TODAY.

**Copeland**
**DEPENDABLE *Electric* REFRIGERATION**




THIS MAKES THE DIFFERENCE

**MODEL ZR-300H**
**Air-cooled unit with Suction-cooled Copelametic motor-compressor**

**COPELAND REFRIGERATION CORPORATION • SIDNEY, OHIO**

# Why don't you sell your customers on Follansbee Terne?

**A Roofing and Sheet Metal Contractor in one of the large cities has sold a majority of the project builders in his area on using Follansbee Terne for gutter and conductor. In doing so, he has increased his profits and provided a better home for the builder and owner.**

**Here's why he was able to make the Sales:**

**1. Terne is Longer Lasting**—adding another quality feature to the home at a minimum increase in cost.

**2. Terne will hold paint**—paint makes a better bond with Terne's lead coating. It does not need to be treated and does not need to be weathered—in fact, it should be painted immediately.

**3. Terne is Economical**—Although it costs slightly more than the cheapest materials, it is the economical buy.

**Here's why you'll like Terne:**

**1. Terne is Easy to Solder**—The tin-lead alloy coating forms a perfect joint.

**2. Terne is Easy to Work**—Terne is more ductile—easy to form and handle—and will cut installation time and cost for you.

**3. Terne Comes in Ten Different Widths**—It is readily available in any width you need.

*So, if you want to increase your profits and give your customers a better, permanent job, why don't you sell your customers Follansbee Terne?*

# FOLLANSBEE
## STEEL CORPORATION

FOLLANSBEE, WEST VIRGINIA

**Cold Rolled Strip • Terne Roll Roofing • Polished Blue Sheets and Coils**

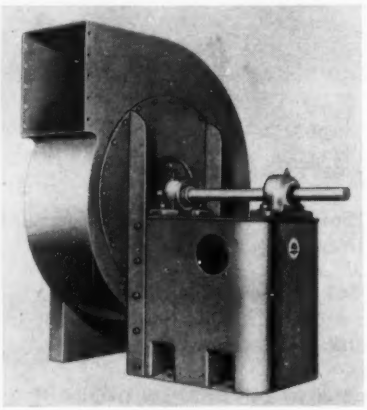
*Sales Offices in Principal Cities*

# EQUIPMENT DEVELOPMENTS

**The latest information on manufacturers' developments is presented here with brief summaries of the application of these products. For additional product information which is available, see this month's New Literature department**

## Large Capacity Blowers

SERIES 106 PACKAGED BLOWERS for industrial application with motor, V-belt drive and running gear enclosure—American Blower Corp., Detroit 32. Sizes 11 through 37, for volumes to 47,000 cfm at 18 in. static pressure, are available with adjustable discharge and in V-belt driven arrangements 1 and 9 or direct connected motor arrangements 4 and 8 for limited sizes; air handling, material handling and long shavings



wheels are available. Sizes 41 through 60, for 125,000 cfm at 18 in. static pressure, have fixed discharge in arrangement 1 with choice of two types of bearing supports and air or material handling wheels. Sizes 11 through 26 have adjustable discharge housings. Adjustable discharge models have wheel diameters to 64⅜ in. and inlet diameters to 37 in.; fixed discharge units have wheels to 104¼ in. diameter and inlets to 60 in. diameter.

## Year 'Round Air Conditioner

CENTRAL YEAR 'ROUND air conditioning unit which requires 5.2 sq ft installation space and has 2 ton cooling capacity — Gibson Refrigerator Co., 515 W. Williams, Greenville, Mich. Also available are 16 other central air conditioners ranging in capacity from 2 to 8 tons, and ¾ and 2 hp window air conditioners.

## Gas Conversion Burner

GBH-140 HORIZONTAL gas conversion burner rated at 60,000 to 140,000 Btuh input and designed for firing with natural, manufactured, mixed or LP gases — Iron Fireman Mfg. Co., 3121 W. 106th St., Cleveland 11, O. Designed for residential conversion heating jobs, unit has a 4 in. diameter radiant flame spreader which is installed directly through the port opening in most oil fired furnaces.

## Industrial Thermostat

MODEL L-37 THERMOSTAT designed for installations where dirt and humidity are problems — General Controls Co., 801 Allen Ave., Glendale 1, Calif. Heavy duty, light duty and millivolt models feature a mercury switch; all major components including bimetal element, case and cover are stainless steel. Heavy duty model has dial lock and external adjustment knob; light duty and millivolt models have external adjustment holes. Unit has two conduit knockouts for wiring from either top or bottom.

## Room Air Conditioners

THIRTEEN MODELS of casement window and "pancake" through-the-wall air conditioning units in deluxe, custom and standard models—Fresh'nd-Aire division, Cory Corp., 221 N. LaSalle St., Chicago 1. Units are in ½, ¾, 1, 1½ and 2 ton models. "Flush mounted" window units will be available in the deluxe and custom series; these units also feature push button controls, the company reports.

## Portable Furnaces

MODEL VO-168 portable oil fired furnaces with vented rating of 168,000 Btuh, designed for zoned heating of buildings—Fageol Heat Machine division, R.D. Fageol Co., 5725 Mt. Elliott Ave., Detroit 11. Unvented rating is 168,000 Btuh. Units can be installed in any location and vented outdoors with an ordinary flue, the manufacturer states.

## Aluminum Baseboard and Diffusers

ALUMINUM BASEBOARD and 2 and 4 ft baseboard diffusers designed for forced air heating, ventilating and air conditioning — Tri-a-lium Products Co., 7429 W. Carmen Ave., Chicago 31. Wall-to-wall baseboard covers entire wall from corner to corner without seams; air is deflected at a 45 deg angle. Diffusers, also of aluminum, are available with or without push button damper control. Two ft model has 20 in. free area, is rated at 700 fpm, 97 cfm and 7000 Btu; 4 ft dif-

# NEW HOME? OLD HOME? BIG HOME? SMALL HOME?

# Worthington air conditioning fits them all!

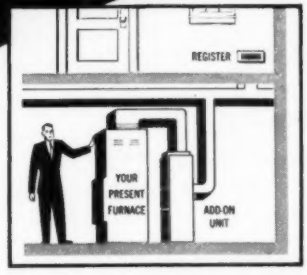
**NEW HOME, NEW AIR CONDITIONER.** That makes good sense for you *and* your customer — when the air conditioner is a Worthington *year-round* residential unit. This good-looking package sends cool, dry, filter-clean air to every room in summer . . . healthfully-humidified, *balanced* heat in winter. And it takes up less than 8½ square feet.

Sure Worthington can handle any air conditioning job — residential *or* industrial. There's more to a Worthington franchise than that, however. Worthington's big-money national ad campaign, heavy promotional back-up, and in-the-field sales promotion specialists spell success for every Worthington dealer. For the full story, write today to Worthington Corporation, Air Conditioning and Refrigeration Division, Section A.5.48-A, Harrison, New Jersey. A.5.48

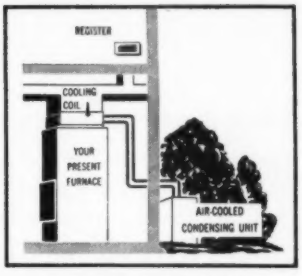
**WORTHINGTON**

***The Best Franchise . . . The Most Complete Line***

## System for every need

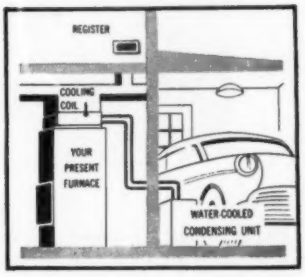



**FOR HOME WITH WARM-AIR FURNACE,** install a Worthington Add-On Unit for filtered, comfort-conditioned air all year 'round. Installation is easy. For extra air delivery, mount a Worthington fan section on top of add-on unit.




**WATER SCARCE?** Don't let that spoil a sale! Worthington's air-cooled condensing unit is all electric — *needs no water at all!* Hooks into warm-air furnace, goes outdoors, in garage or breezeway. 2, 3, or 5 hp sizes.

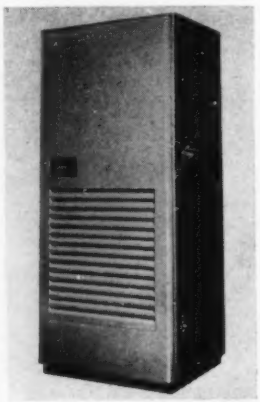
**SHORT ON SPACE?** Here's the answer to that problem — Worthington's new Packaged Water-Cooled Condensing Unit. This compact, adaptable unit goes anywhere — closet, basement, attic, even the garage. Use it with Worthington's Remote Duct Cooling Coil for existing homes or new construction.



fuser has 36 in. free area, is rated at 500 fpm, 125 cfm and 9000 Btu.

## Packaged Air Conditioner

"DYNAPAC" PACKAGED air conditioners in 2, 3 and 5 hp sizes, in both air and water cooled models—Heating and Cooling division, Union Asbestos & Rubber Co., 332 S. Michigan Ave., Chicago 4. Unit has



hermetically sealed compressor, the company states. Built-in plenum chamber and discharge grille located on top are featured. Standard connections permit installation with ductwork. Return connections are at rear of the cabinet. Two hp models are 58 × 28 × 19½ in.; 3 hp units are 69 × 30 × 22 in.; 5 hp models are 72 ×40 × 24 in.

## Brick Panel Chimney Housing

BRICK PANEL HOUSING for packaged masonry chimney line—Van-Packer Corp., 1049 State St., Bettendorf, Ia. Constructed of cement-asbestos, housing is

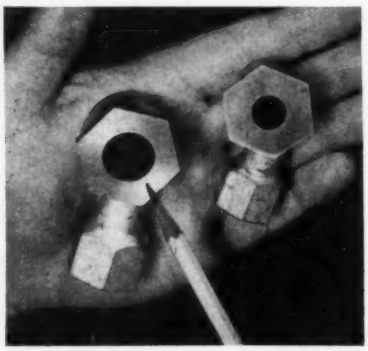
in 2, 3 and 4 ft lengths, measuring 24 × 48 in. Housing cap and rain cap are pre-assembled; unit is entirely packaged, including flashing. Flue sections are of ⅝ in. fire clay tile liner, 3 in. vermiculite-concrete insulating wall and cement-asbestos jacket. Housing is in buff, white, or red.

## Counterflow Furnace

MODEL GBC70HR COUNTERFLOW furnace rated at 70,000 Btu, designed for perimeter systems in basementless homes—Delco Appliance division, General Motors Corp., 391 Lyell Ave., Rochester 6, N.Y. Unit is said to require installation space of 21 × 31 in. Cabinet is 20 gage steel; heat exchanger has 38 steel fins projecting from primary surface.

## Self-Cleaning Spray Nozzle

"CANT-CLOG" SELF-CLEANING spray nozzle with "elastic" diaphragm—Carrier Corp., 300 S. Geddes St., Syracuse 1, N.Y. When lint or other foreign material is caught behind the orifice, pressure from the water



builds up within the nozzle forcing the flexible diaphragm to stretch, enlarging the orifice to permit restrictive particles to be expelled, the company reports. Nozzles for medium pressures are in two sizes with low pressure cap available for smaller model.

## Vertical Discharge Attic Fans

VERTICAL DISCHARGE ball bearing attic fans in 24 and 30 in. sizes—Emerson Electric Mfg. Co., 8100 Florissant Ave., St. Louis 21, Mo. Units are designed for attics with low headroom; fans rest on framed ceiling opening. Smaller model delivers 5200 cfm, while 30 in. unit delivers 7000 cfm. Features listed by the company are deep pitched blades, built-in "lifetime" lubrication and rubber mounted motor with thermal overload protector. Units are finished in baked enamel.

## Light Duty Toggle Clamps

"MIDGET-U" MODEL 215-U light duty toggle clamp with "articulated" linkage and low closed silhouette—Detroit Stamping Co., 350 Midland Ave., Detroit 3. Unit has adjustable bolt assembly; total weight is 4 oz, holding pressure is 150 lb and overall length is

# LENNOX makes a report to its friends...

## Regarding the Progress of the Company and a Change in the Company Name

There is, of course, nothing dramatically important in the simple fact that Lennox is changing its corporate name.

But the happenings that have caused the name change are important, and we thought our many friends – our thousands of dealers, suppliers and employees – would like to hear about them.

Those of us who have long been associated with Lennox – and have been so busy building heating and air conditioning equipment – are frequently surprised when we stand back to view our accomplishments in proper perspective.

It is satisfying, of course, to find that Lennox has grown to be the largest company of its kind in the world. Our growth to this position was no flash in the pan. When we landed solidly in first place it was because of our policies, people and products; and it is for these reasons that we have stayed there.

We have now entered the home cooling and air conditioning field in a big way. Already multiple thousands of homes are Lennox cooled. Leading air conditioning and heating dealers throughout America are featuring Lennox cooling equipment. At our present rate of growth in a relatively young industry, Lennox confidently expects to hit the top in residential cooling too, in a few years.

We have also added divisions for the manufacture of agricultural crop drying and processing equipment, as well as barn ventilating equipment and a number of other articles for home, farms, commerce and industry. Still other divisions concentrate on the building of special machinery, jigs, dies, fixtures and tools.

With all these developments, the time has come for a company name that properly encompasses our widespread activities. That is why as the year changes our name will change officially.

That is the only change, however – just the name. There has been no change of ownership, management, officers or policies. There has been no transfer of stock and no other company is stepping into the Lennox picture in any way.

As more people in more walks of life rely on the Lennox name, our dealers, suppliers and employees, too, will continue to share in our growth.

We are grateful indeed that in less than the span of one lifetime this company, which had its modest start literally in the heart of an Iowa corn field, has been privileged to grow up to serve so many of its fellow Americans.

John W. Norris

JOHN W. NORRIS, President

*On January 1, 1956, instead of The Lennox Furnace Company, our corporate name will be...*

**LENNOX Industries Inc.**

*Established 1895*

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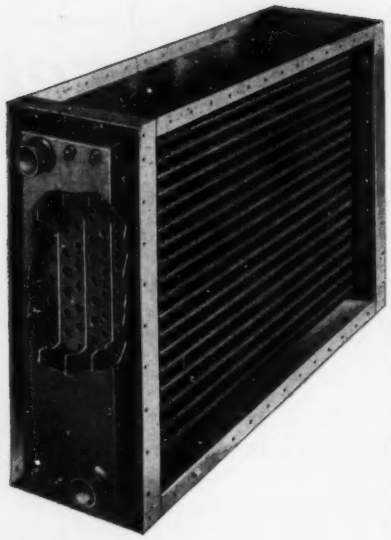
FORT WORTH, TEXAS • DECATUR, GA. • DES MOINES, IOWA *In Canada:* TORONTO and CALGARY



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Completely drainable and easily cleaned, Aerofin Type "R" coils are specially designed for installations where frequent mechanical cleaning of the inside of the tubes is required.

The use of ⅝" O.D. tubes permits the coil to drain completely through the water and drain connections and, in installations where sediment is a problem, the coil can be pitched in either direction. The simple removal of a single gasketed plate at each end of the coil exposes every tube, and makes thorough cleaning possible from either end.

The finned tubes are staggered in the direction of air flow, resulting in maximum heat transfer. Casings are standardized for easy installation. *Write for Bulletin No. R-50.*

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101 Greenway Ave., Syracuse 3, N.Y.

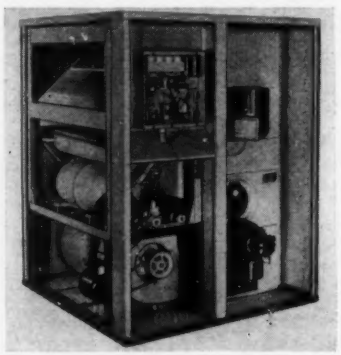
*Aerofin is sold only by manufacturers of fan system apparatus. List on request.*


## equipment developments (Continued)

5 7/16 in. Thumb pressure produces clamping action; forefinger controls release. Larger model 225-U has closed length of 6½ in., holding pressure of 300 lb., weighs 6½ oz. Model 235-U is 10½ in., has 600 lb holding pressure, weighs 1 lb 4 oz.

### Year 'Round Air Conditioner

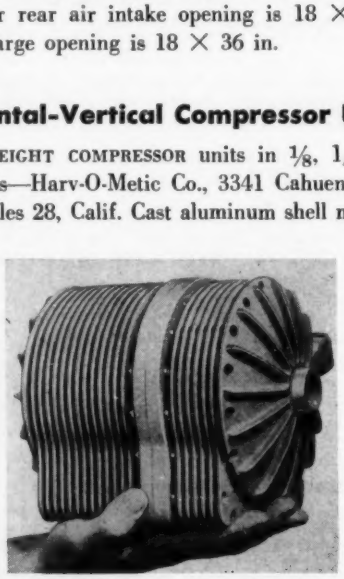
YEAR 'ROUND air conditioning unit with 5 ton capacity cooling system and 175,000 Btu input heating system—C. A. Olsen Mfg. Co., Filbert St., Elyria, O. Cooling system has 5 hp gas cooled compressor,



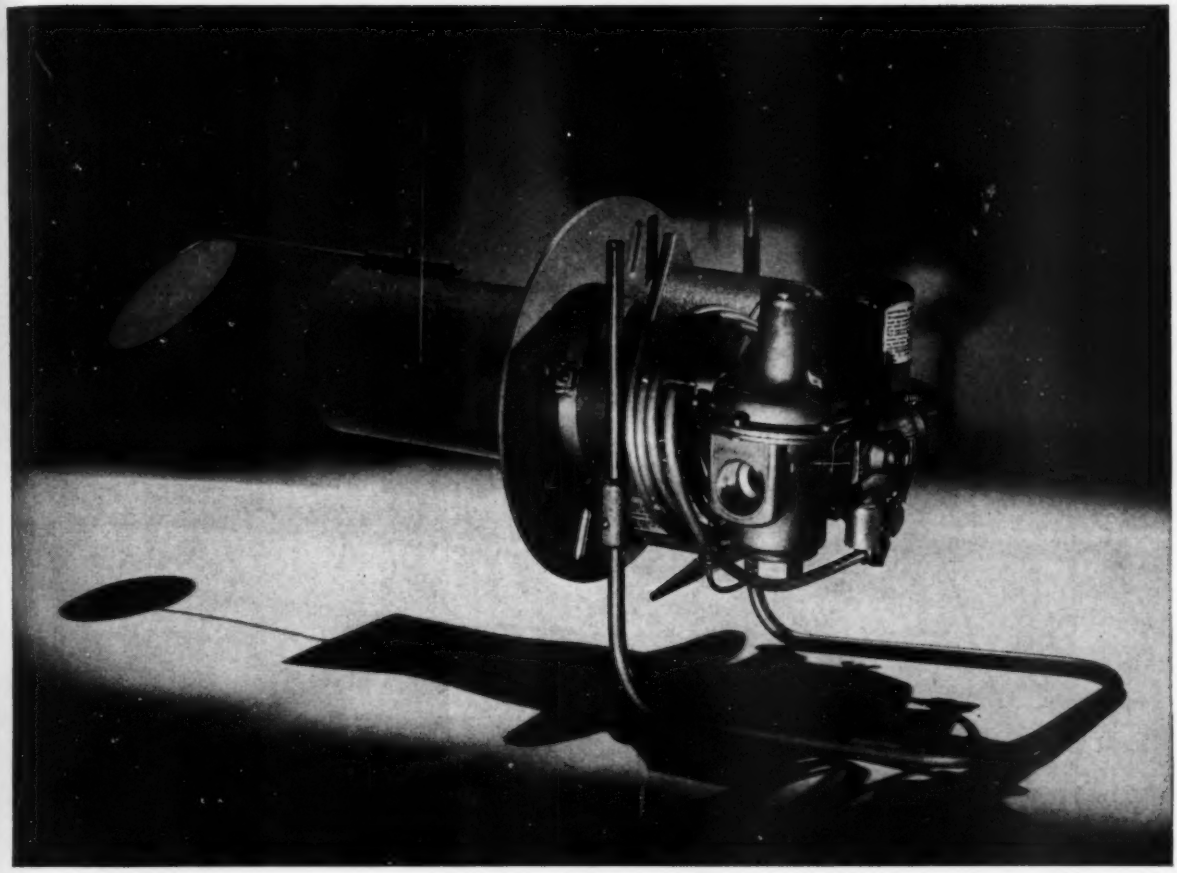
capillary tube metering device, staggered tube cooling coil, water cooled shell, fin tube compressor and modulating water control valve. Heating unit can be fired with either gas or oil burner; heating output at the bonnet is said to be 140,000 Btu with either type of fuel. Cabinet dimensions are 51 × 50 × 68 in.; bottom or rear air intake opening is 18 × 47 in.; air discharge opening is 18 × 36 in.

### Horizontal-Vertical Compressor Unit

LIGHT WEIGHT COMPRESSOR units in ⅛, 1/6 or ¼ hp models—Harv-O-Metic Co., 3341 Cahuenga Blvd., Los Angeles 28, Calif. Cast aluminum shell measuring



8¾ × 6⅝ in. houses compressor unit. Compressor can be mounted in either horizontal or vertical position. Featured are constant pressure oiling system,



## This Quality Burner costs you less than any comparable model

Lowest-priced burner in the field . . . easiest to install . . . practically no service calls . . . that's what our dealers are saying about the new Barber GUN-HEAT gas conversion burners.

Look at the GUN-HEAT model shown above. It's the popular SNG 1-A designed for converting oil-fired boilers and furnaces to gas. AGA tested and listed from 65,000 to 185,000 BTUH on natural and mixed gases. Other models are available up to 350,000 BTUH.

Because we know that repeated service calls can gobble up dealer's profits, Barber engineers have wrapped up 35 years of burner know-how in the GUN-HEAT to make it trouble-free in operation and easy to install correctly.

The SNG 1-A, for example, has no moving parts. The venturi is super-strong pressed steel and the blast tube is seamless welded.

How can quality burners be priced so low? Briefly, because this burner is designed for specific applications, we have been able to standardize on parts and substitute steel fabrications and steel stampings in place of costly castings. The result is mass production methods for Barber — and lower costs for you.

*Write for specifications and prices on the GUN-HEAT to the address below.*

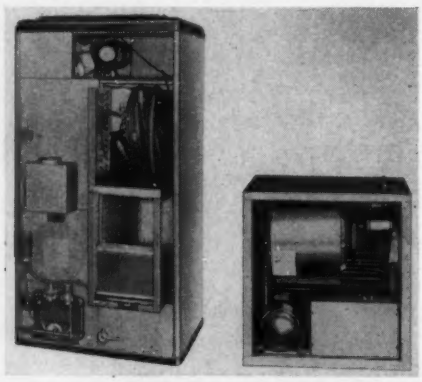
THE Barber MANUFACTURING COMPANY
GAS AND OIL BURNER DIVISION
3701 Superior Avenue, Cleveland 14, Ohio • HE 1-6045

## equipment developments (*Continued*)

"roller" type compressor design, resilient suspension mounts. Designed for use where space is at a premium, the ¼ hp assembly weighs less than 23 lb, according to the company.

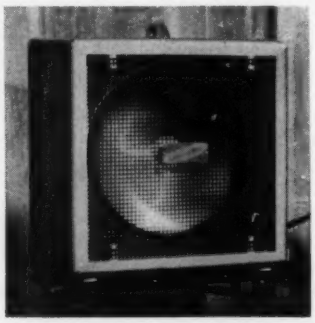
### Year 'Round Air Conditioner

COUNTERFLOW YEAR 'ROUND air conditioner with 3 ton cooling capacity and gas or oil fired heating system rated at 140,000 Btu input—Henry Furnace Co., Medina, O. Designed for perimeter heating and cooling of basementless homes, unit directs air flow downward. Remote air cooled, two-stage system with two compressors, condensers and cooling coils provides cooling; vertical cooling coil alone is contained within the furnace cabinet. Cooling coil is connected to condenser unit by 30 or 50 ft of flexible copper refrigerant tubing.



### Portable Air Filter

"SMOG-FREE" PORTABLE air filter with activated carbon filter, designed to remove gases and odors from the air—Radex Corp., 2076 Elston Ave., Chicago 14. Unit draws contaminated air through a 2 in. aluminum filter on back side of the cabinet where dirt and dust particles are removed; air then passes through the replaceable activated carbon filter which absorbs

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gases, odors and other vapor impurities. Unit is in two sizes: smaller unit is 10 × 14 × 14 in., weighs 21 lb and has a capacity of 300 cfm in high speed and 140 cfm in low speed; larger unit is 14 × 17 × 17 in., weighs 64 lb, and has capacity of 900 cfm at high speed and 450 cfm at low speed.

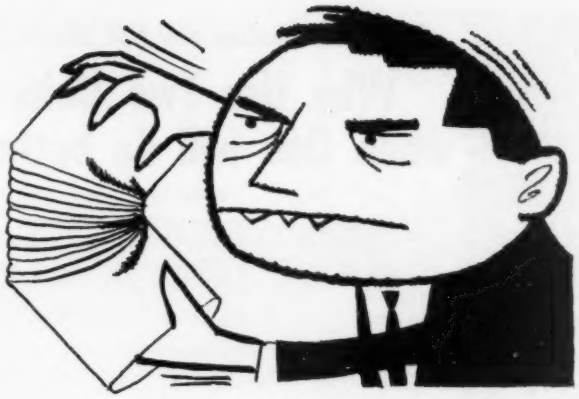
## Low Temperature Warning

"ALARM-A-LITE" signal device which automatically flashes a household lamp if temperature in the home drops below a safe level — Custom Mfg. Co., 4416 W. Fullerton Ave., Chicago 39. Designed to prevent damage in the

home while occupants are away, device plugs into 110 volt outlet. Lamp placed in window to attract attention is in turn plugged into the safety device. Thermostatically controlled device flashes lamp when inside temperature falls to 50 F, continues to flash until temperature is restored to a safe level.

## Fractional Hp Motors

FRACTIONAL HP 48 frame motors for coolers, blowers, burners, pumps etc., rated from 1/12 to 1/3 hp — Century Electric Co., 1806 Pine St., St. Louis 3, Mo. Motors have ratings identical to present 56 frame motors produced by the company, including operating temperatures, torque requirements and current characteristics. Motors are in split phase, permanent split capacitor, capacitor



new

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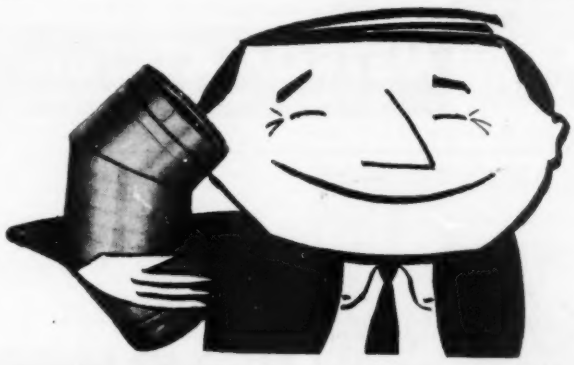

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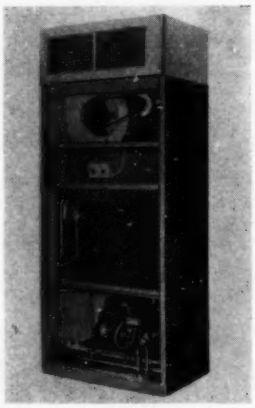
## *equipment developments*

start and polyphase types. Featured are aluminum rotor, integrally cast rotor winding and fan, cluster type fan, closed frame and "drip-proof" bearing brackets, and single phase motors equipped with starting switches.

### Packaged Air Conditioners

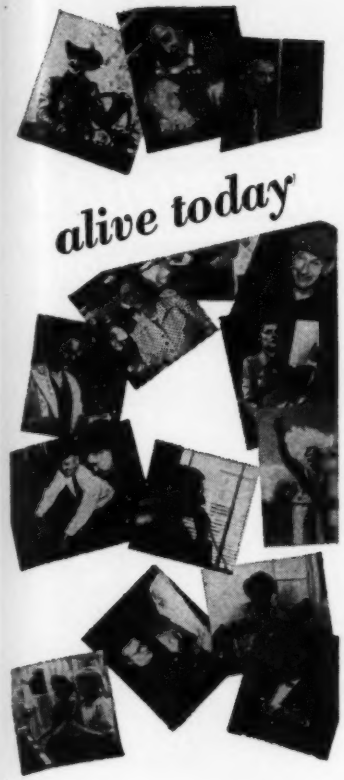
PACKAGED AIR CONDITIONER line in 3, 5, 7½ and 10 ton models featuring models 8ACCU and 10ACCU, 8 and ten ton capacity condensing units — Typhoon Air Conditioning Co., Inc., 505 Carroll St., Brooklyn 15. Also



included is copper jet water cooled condenser utilizing "tube within a tube" design for 3, 5 and 7½ ton units. Cabinets are 14 gage steel in wrap-around sections reinforced at critical spots. Heat pumps and heating-cooling units also will be included in the company's line.

### Shaded Pole Motors

MODEL SP-A shaded pole motors in ratings from 1/500 to 1/80 hp at speeds from 1200 to 1550 rpm — Morrill Motors, 3119 Fairfield Ave., Fort Wayne, Ind. Designed for replacement application, the motors can be equipped with 5 mounting brackets to adapt the unit to compressors, vertical walls and other applications. Features listed by the manufacturer include oil reservoir, cast iron bearings, spiral groove viscosity

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To learn how to head off cancer, call the American Cancer Society office nearest you or simply write to "Cancer" in care of your local Post Office.

*American Cancer Society*


## *equipment developments*

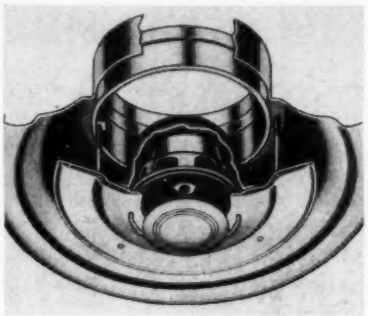
lubrication pump, die cast aluminum rotor.

### Brushable Zinc Coating

ZINC COATING said to be 95 percent pure which is applicable with a brush or spray gun to standing structural parts — Wilbur & Williams Co., 130 Lincoln St., Brighton 35, Mass. Coating is said to renew galvanizing on parts of cooling towers and ductwork which are stationary or too large to be dipped in electrolytic dip tanks.

### Speaker-Air Diffuser

CEILING AIR DIFFUSER designed to accommodate an 8 in. high fidelity loud speaker for public address systems — Connor Engineering Corp., Shelter



Rock Lane, Danbury Conn. Unit is available in three neck sizes, 14, 16 and 18 in. with or without damper. Any extended range 8 in. speaker may be used. Air discharge does not distort sound quality, nor are the diffuser's capacity or performance affected by the speaker housing, according to the manufacturer.

### Iron Powder Electrode

"FLEETWELD 47" iron powder type electrode designed for welding in any position — Lincoln Electric Co., 22801 St. Clair Ave., Cleveland 7, O. Electrode is designed for high speed welding of mild steel in out-of-position welds on a-c or d-c current. Including powdered iron in the coating is said to produce higher deposition rates. It can be operated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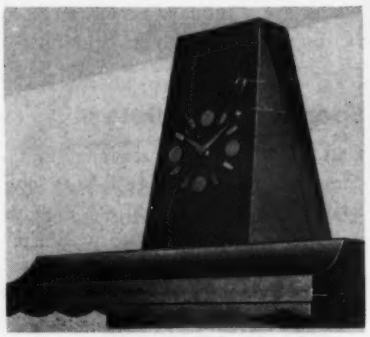
## equipment developments

with either drag or short arc techniques, according to the manufacturer.

### Ventilating Hood

MODEL 400 ventilating hood with vent cover and twin wheel blower — Stanthony Corp., 2305 W. Alameda Ave., Burbank, Calif. Vent cover is in two styles, with or without electric clock,



and covers blower vent and wiring between hood and ceiling. "Aristocrat" and "Provincial" styles are in 4 sizes, 30, 36, 42 and 48 in. in choice of colors. Twin grease filters slide out for washing; pull box in blower housing permits running power direct without intermediate connections.

### Broken Line Template

TRANSPARENT PLASTIC template for broken line patterns or stencils—Dot-N-Dasher, P.O. Box 668, Cresskill, N.J. Template is 12 in. long, 2¼ in. wide and 0.0075 in. thick; long and short dashes, or long and short dash and dot patterns are possible. Uses are to identify components in drawings, to separate duct lines on a single drawing, and to identify details such as water, air lines, various electric circuits, air flow diagrams and equipment layouts.

### Round Thermostat

MODEL TR-125 round thermostat with snap action switch which controls the circuit—Crise Controls division,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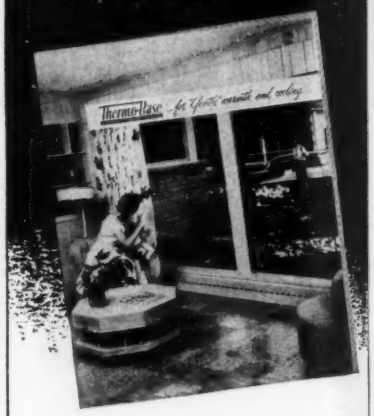


This beautiful new four-color catalog explains the revolutionary, nationally advertised, Thermo-Base system of heating and air conditioning. It will help you get **more** heating jobs and enable you to install the most comfortable and efficient baseboard air distribution system available.

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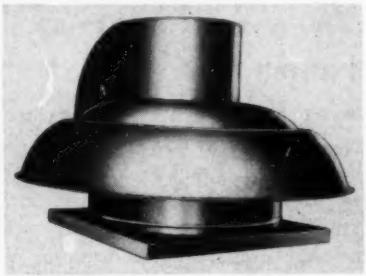
## equipment developments *(Continued)*

Acro Mfg. Co., 2040 E. Main St., Columbus 16, O. Separate scales are provided for room temperature and temperature setting. Adjustable heater covers range of 0.35 to 1.2 amp. Larger model is also available for millivolt circuits.

### Centrifugal Roof Ventilator

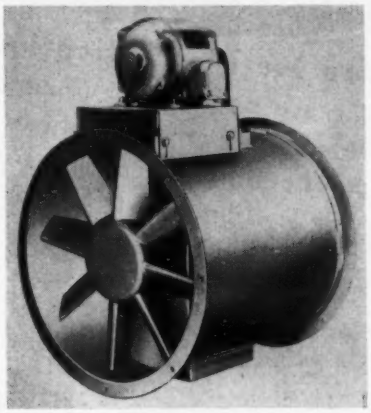
LOW SILHOUETTE centrifugal roof ventilator designed to move large volumes of air at low speeds and noise



levels—DeBothezat Fans division, American Machine and Metals, Inc., East Moline, Ill. Backwardly curved centrifugal fan wheel runs in venturi shaped inlet ring which is said to reduce air turbulence. Unit is designed to blend with modern architecture.

### Heavy Duty Axial Fans

TYPE L AXIAL FANS with contoured hub designed to reduce turbulence over motor and back flow—Chicago Blower Corp., 9867 Pacific Ave., Franklin Park, Ill.



Hub is contoured and formed to approximate the motor diameters and varies from 25 to 70 percent from the wheel diameters. Blades are designed for even distribution of air velocity from hub to tip, the company reports. Blade angles decrease from large at the hub to small at the tip. Wheels of 2, 4, 6 and 8 blades are available for various pressure and volume requirements. Models include direct and V-belt drives; 14 wheels from 12 to 72 in. diameters are available.

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equal wings — parallel holes
equal wings — staggered holes
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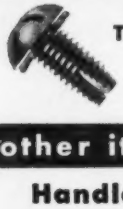
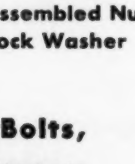
continuous spring hinges

Sems and Keps



Thread-Cutting SEMS



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Handles, Pulls, Stove Bolts, Catches, Sheet Metal Screws

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Rockford, Illinois

# *new literature . . .*

## Oil Fired Heating Units

BROCHURE describes series 551 packaged oil fired winter air conditioners — Thatcher Furnace Co., Dept. P, Garwood, N. J. Included is a section explaining how summer air conditioning units may be added easily and economically to central winter air conditioners. Also contained is a capsule version of the company's "complete indoor comfort story." Design and construction features of the units are illustrated with cutaway drawings.

## Axial Airfoil Fans

ILLUSTRATED BULLETIN AA 101 describes redesigned "Chicago" axial airfoil fans — Chicago Blower Corp., 9869 Pacific Ave., Franklin Park, Ill. The fans are designed in eight general categories for ventilating under various conditions. Of heavy steel construction, they are available with direct or V-belt drive.

## Exhaust Fans

BULLETIN No. 6414 describes Model G ventura fans for small commercial exhaust application — American Blower Corp., Detroit 32. The catalog lists such performance data as cfm at various static pressures, fan rpm, motor hp, quietness rating and maximum net weight for each of 25 direct-drive units. Recommended time for complete air changes for various establishments are given in a list which includes bakeries, bowling alleys, laboratories, laundries, restaurant dining rooms and kitchens, stores and theaters. Installation drawings give basic dimensions for all sizes in the series.

## Gap Frame Double Crank Presses

BULLETIN 65C presents data on gap frame double crank presses consisting of upright series B and open back inclinable series BI — Niagara Machine & Tool Works, 683 Northland Ave., Buffalo 11. Featured are wide, box type slide fully contained within gibbing; abundance of die area; all-side accessibility of die area; feeding from either side or front to back; integral, all-steel frames; precision "U" flat gibbing brought down close to work; oversize air counterbalance; synchronized slide adjusting mechanism; centralized oil lubrication of bearings and gibs; electro-pneumatic and mechanical sleeve clutches.

## Year 'Round Heating-Cooling Systems

CONSUMER BOOKLET describes how "Combination" units operate to provide year 'round indoor comfort — A. Y. McDonald Mfg. Co., 12th & Pine Sts., Du-

buque, Ia. Entitled *Home Owner's Guide to Better Indoor Living*, the booklet gives many helpful suggestions for heating and cooling economies and explains the operation of various types of warm air heating equipment that can be used for wintertime comfort and utilized for summer air conditioning as well. It is fully illustrated to show how "McDonaldaire" oil and gas fired heating units can be installed when building, with summer air conditioning added easily and economically at a later date.

### Vibration Control for Cooling Units

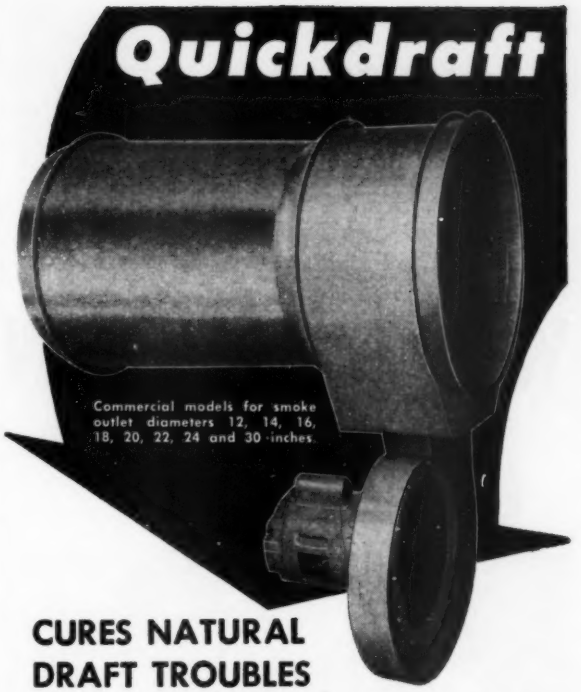
HOW TO WRITE vibration isolation specifications for air conditioning and related equipment is explained in bulletin F2A — The Korfund Co., Inc., 48-01A 32nd Pl., Long Island City, N. Y. The booklet contains a discussion of the factors involved in the selection of the various isolation media commercially available, with particular attention to the influence of existing job conditions. A selector chart is included to simplify the writing of specifications.

### Gages and Controls

WHERE, WHY AND HOW to use gages and controls is explained in a 72 page catalog — F. W. Dwyer Mfg. Co., Dept. AAC, P. O. Box 373, Michigan City, Ind. Included is data on the measurement of combustion, draft, pressure, flow, vacuum, $CO_2$, smoke, velocity, static pressure, pressure differential, temperature and other factors relating to the heating and ventilating field. The catalog is sectionalized by type of instrument. The index features a checkoff form which can be used for requesting further information. Also included is the current price list.

### Steel Press Brakes

FOUR SERIES of "Chicago" press brakes for bending and forming sheet metal and steel plate are described in catalog sheets A-955, B-955, C-955 and L-955 — Dreis & Krump Mfg. Co., 7400 S. Loomis Blvd., Chicago 36. Among the features listed by the company are all-steel, welded frame and deep section bed and ram of rolled steel plate designed to assure permanent alignment and minimum deflection under load. A double-end drive from the intermediate shaft is said to eliminate strain in the intermediate shaft providing even application over the length of the ram for accurate bending. Other features include a twin disc friction clutch and band brake on the flywheel shaft for efficient drive and sensitive control, and a split ram adjustment that permits adjustment for tapered work. Many optional features are available in all models to meet special requirements.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Increasing concentration of carbon and sulphur dioxides in the atmosphere, recently reported by scientists, handicaps ordinary chimneys by decreasing natural draft ($CO_2$ is 55% and $SO_2$ is 225% heavier than air) . . . and by demanding more draft because additional air is required to provide sufficient oxygen. In addition, current trends constantly demand more draft . . . (1) new fuels that require more oxygen . . . (2) longer flue travel in furnaces and boilers. As a result, more and more heating plants operate at low efficiency because of gravity draft troubles.

**WITH POWER DRAFT THAT ASSURES HEATING PLANT EFFICIENCY**

**. . . No Fans or Motors in Smoke Line**

Quickdraft power draft stops sooting, eliminates chattering, drys wet chimneys and greatly increases combustion efficiency. It does not obstruct smoke line with fans or motors. Quickdraft assures top performance from old and new heating plants. All models are approved by Board of Standards and Appeals, New York City. Write today for details.

Residential models for smoke outlet diameters 6, 7, 8, 9 and 10 inches.

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adjustable air diffusers

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YOUR INSTALLATION
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Installation is simple as: (A) attach the outer cone of the Kno-Draft Diffuser to the duct, (B) fasten the pre-assembled diffuser unit to three suspension bolts, (C) adjust air direction to any discharge angle from horizontal to vertical with just a few screwdriver turns. Balancing and air volume adjustment are equally simple. Single annular air stream permits direct volumetric readings; damper is regulated by calibrated screw.

For full information, send for the Kno-Draft Data Book. Connor Engineering Corporation, Danbury, Connecticut.

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**Dept. M-125, Danbury, Connecticut**

Please send copy of your 32-page Kno-Draft Data Book.

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**Company**_____

**Street**_____

**City**_____ **Zone**____ **State**_____

## new literature (*Continued*)

### Room Air Conditioners

SALES PLAN BOOK emphasizes the selling features of "Deluxe," "Custom" and "Imperial" room air conditioners — Mitchell Mfg. Co., 2525 N. Clybourn Ave., Chicago 14. Designed for use in selling, the booklet is attractively illustrated and contains general specifications for all three series. Also included are descriptions of advertising programs developed for dealer use and a list of floor and window displays now available. The booklet is of the loose leaf type to permit insertion of local price lists and factory releases as they become available.

### Electric Motors

SERIES 100 MOTORS featuring light weight and compact design are described in a 16 page catalog — Howell Electric Motors Co., Howell, Mich. Cutaway illustrations show the company's motor cooling system and bearing construction. Dimensions are included for both totally enclosed fan cooled motors and open drip-proof motors.

### Clay Pipe Duct Systems

ILLUSTRATED INSTALLATION MANUAL for perimeter heating systems contains specifications, dimensions and detailed illustrations and plans for installing clay pipe warm air heating duct systems — Clay Sewer Pipe Association, 311 High-Long Bldg., 5 E. Long St., Columbus 15, O. Tables are included covering floor heat loss factor, duct sizes, and minimum register free area required. Also included is a return air grille and duct sizing chart.

### Arc Welding

CARBON-DIOXIDE-SHIELDED consumable-electrode arc welding is the subject of a 12 page, illustrated booklet — Air Reduction Sales Co., 60 E. 42nd St., New York 17. Subjects covered include methods of supplying and the flow characteristics of carbon dioxide, the chemical activity of carbon dioxide, properties of weld metal, operating characteristics and specific applications.

### Hole Punching Equipment

BULLETIN G-1 illustrates and describes "Unipunch" Series A hole punching equipment for unitized tooling in presses and brakes — Punch Products Corp., 3800 Highland Ave., Niagara Falls, N. Y. The complete line of series A units permits punching round and shaped holes up to 1½ in. in diameter in very thin material, up to ¼ in. thick mild steel sheets, angles, extrusions,

channels and various other shaped parts. The company states that the design permits easy, economical replacement and interchangeability of punches and dies in holders which maintain the concentricity of punch, die and pilot pin.

## Vibration Isolating Equipment

VIBRATION MOUNTINGS CATALOG G-55 features a chart for determining the minimum deflection required for a selected vibration isolation efficiency — Vibration Mountings, Inc., 76-17 Queens Blvd., Elmhurst, N. Y. Shown are the new "Spring-Flex" as well as pad type mountings. Typical installations are illustrated and diagrams and charts are included to facilitate selection of types and sizes for specific needs.

## Stainless Steel Fastenings

CATALOG 55A covers stainless steel fastenings including cap screws, nuts, washers, machine screws, sheet metal screws, etc. — Star Stainless Screw Co., 699 Union Blvd., Paterson 2, N. J. Included are standard stainless steel specifications and corrosion resistance tables designed to serve as a guide in the selection of various types of stainless alloy grades.

## Zinc Alloy Cap Nuts

DATA ON "GRC" zinc alloy cap nuts is presented in a one page bulletin — Gries Reproducer Corp., 400 Beechwood Ave., New Rochelle, N. Y. The nuts are available in plain, bright and all commercial finishes. The bulletin includes schematic drawings and compact tables of stock sizes and dimensions for both closed-end and open-end types.

## Soldering and Soldering Fluxes

BULLETIN describes various types of soldering and the action of different types of fluxes — Pfanstiehl Laboratories, Inc., 104 Lake View, Waukegan, Ill. Suggestions for proper soldering are given together with recommendations for selection of fluxes and their application in such operations as soldering on stainless steel, vertical surfaces, etc.

## Insulation

MANUAL discusses installation techniques for insulating wood joists and studs, steel beams and trusses, ducts and masonry walls — Infra Insulation Inc., Dept. R, 525 Broadway, New York 12. Entitled *Heat Flow by Radiation in Buildings*, the booklet contains almost 100 illustrations including charts, diagrams and photographs. It is divided into three sections covering

Homes in Brynhaven, beautiful new residential section in Elmhurst, Illinois, have ductwork made of TI-CO.

says **James N. Johnston,** Shop Supt. of **The Austin Sheet Metal Company,** Chicago, Illinois.

**"TI-CO keeps our labor costs down!"**

"When you're the sheet metal contractor for large housing projects involving hundreds of homes, such as the Brynhaven development in Elmhurst, it's necessary to keep a large inventory of fittings in stock. Mass production of sheet metal fittings can be very costly if you're having trouble with cracking and flaking of the "iron". That's why we like Inland's TI-CO. We never have to waste time and money doing an intricate fitting over again because the coating on TI-CO doesn't come off, even on our toughest lock-seaming jobs. We plan to start production on a new fitting shortly which requires some pretty tough forming. We're going to use TI-CO on it, exclusively."

**INLAND TI-CO GALVANIZED SHEETS . . .**

- non-flaking. Galvanized by a patented, continuous process, eliminating brittle iron-zinc layer that causes flaking.
- always uniform.
- cost no more!

*Ask your dealer for Inland TI-CO Look for this stencil on all your galvanized sheets.*

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the simplified physics of heat flow, installation techniques, and typical projects. Much of the technical information was compiled from Housing Research Paper No. 32 of the Housing and Home Finance Agency entitled *The Thermal Insulating Value of Air Spaces.*

## Cartoon Calendar for 1956

CALENDAR FOR 1956 features 12 original cartoons depicting quirks of business and industry — Minneapolis-Honeywell Regulator Co., 2726 Fourth Ave., S., Minneapolis 8. Automation, electronic "brains," research, incentive work and the "do-it-yourself" fad are among the subjects covered.

## Sheet Metal Working Machinery

ALL STEEL PRESS BRAKES built in eight series with capacities from 15 to 200 tons and bed and ram lengths from four to 14 ft are described in a six page circular — Excelsior Tool & Machine Co., 31st and Ridge Ave., East St. Louis, Ill. Features include low installation cost, simplicity of operation, and little maintenance work. Also available is a two page data sheet covering a combined double action inside shearing machine. Openings of any size or location, square, oblong or rectangular in large or small sheets can be sheared without reversing or turning the sheets, the company states.

## Baseboard Heating, Cooling Systems

CATALOG FEATURES PHOTOGRAPHS of typical residential, small commercial and church installations of baseboard heating and cooling systems — Thermo-Base division, Gerwin Industries, Inc., 214 Spring St., Michigan City, Ind. A table of capacities for various lengths of 6 in. duct and elbows is given. Designed to appeal particularly to the home owner, the catalog contains several pages giving information comparing various types of heating systems.

## Gas Water Heaters

LITERATURE on "REX-XL" and "REX-XLR" gas water heaters comprises two consumer folders, radio spot announcements and newspaper ad mats — The Cleveland Heater Co., 2310 Superior Ave., Cleveland 14. The material is imprinted free of charge for authorized dealers and utilities. Also being offered is a chart showing the comparative performances of gas and electric water heaters.

*Season's Greetings*

*to our Many Friends*

•

Duro-Dyne Corporation

**He's alive . . . and you helped**

People still die from tuberculosis —this year one American every twenty-seven minutes!

Yet the money which you give for Christmas Seals has helped to save thousands of lives.

Christmas Seals fight tuberculosis year-round—through education, case finding, patient rehabilitation, and research.

Make Christmas Seals a part of *your* holiday giving, today.

# *we hear that . . .*

▸ EFFECTIVE DECEMBER 31 the Lennox Furnace Co. is changing its name to Lennox Industries, Inc. According to John W. Norris, president, the new name was selected as being more descriptive of the wide range of products and services now being offered by the company. Mr. Norris points out that no organizational changes are contemplated — that the change applies to the wording of the company name only.

▸ THE PARKER-KALON division of General American Transportation Corp. recently celebrated the opening of its new plant at Clifton, N. J. The plant is a one story structure with a floor space totaling 267,000 sq ft, of which 225,000 sq ft will be used exclusively for manufacturing.

In preparing the factory design, the needs and safety of employees were carefully considered. For example, beverage and automatic canteen service dispensers are provided in a personnel aisle which also serves as a smoking area. The aisle is protected by heavy stanchions to prevent the entry of trucks or other vehicles.

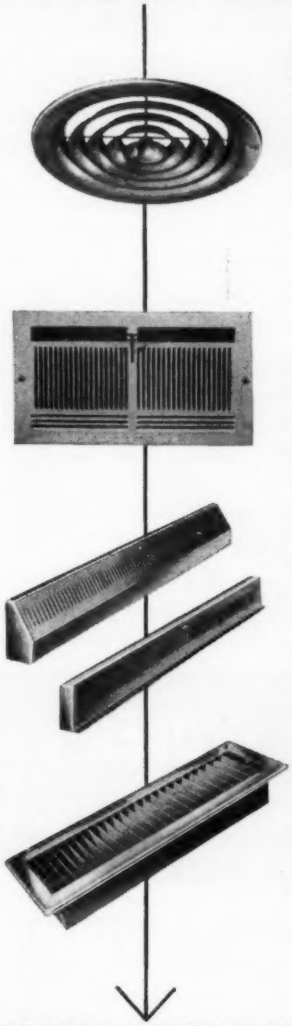
An outstanding feature of the new plant is its air conditioned laboratory for research and development, which is easily accessible from both the factory and the engineering department yet is completely vibration isolated from both. It is equipped with all kinds of gas, air, water and electric facilities so that any customer-assembly can be duplicated in order to test particular applications which may be involved.

▸ THE DIRECTORS of Typhoon Air Conditioning Co. and the Hupp Corp. have approved a proposal to merge the two firms. Under the terms of the proposal, the Typhoon company will operate as Typhoon Air Conditioning Co., Division of Hupp Corp., and will continue all franchise agreements Typhoon now has in effect. Don Petrone will continue in charge of Typhoon activities as president.

▸ THE CORY CORP. has purchased all capital stock of the Mitchell Mfg. Co., which will continue to operate as it has in the past but as a wholly owned subsidiary of the Cory firm. J. W. Alsdorf, president of Cory, stated that no personnel changes are contemplated except that A. N. Pritzker, chairman of the Cory board of directors, will occupy a similar position for the Mitchell subsidiary and Mr. Alsdorf will be president of the two firms. B. A. Mitchell will retire as active head of the company bearing his name but will continue to serve in an advisory capacity. "Otherwise," Mr. Alsdorf said, "we will maintain Mitchell as a separate and distinct subsidiary of Cory having the same management, sales and distributor organization as previously. Current Mitchell distributors and dealers will remain the same and will operate under the same policy they have in the past."


ceiling . . . floor
. . . or anywhere between

**Better Diffusion**



Standard Registers *shape* comfort, *aim* it, *diffuse* it evenly

Ceiling to floor, there's a Standard Register or Diffuser for a better job of shaping, aiming or spreading conditioned air. For ceiling outlets, two Standard Ceiling Diffusers—with flush or extended louvers—send warm or cool air to every corner evenly. (Also dampers and installation rings.) And for positive control of warmed air from the floor, there's the Standard Perimeter Floor Register with exclusive dialamatic control. Select the exact diffuser, register or grille for virtually any air-directing job from the full Standard line.

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3137 W. 49th Place, Chicago 32, Illinois
Please send me your catalog No. 54, on Registers and Grilles.

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**Standard** STAMPING & PERFORATING COMPANY
3137 W. 49TH PLACE, CHICAGO 32, ILLINOIS

## we hear that (*Continued*)

▸ FACTORY SCHOOLS on summer air conditioning have been scheduled for the first quarter of 1956 by the Armstrong Furnace Co. and are open to authorized dealers and wholesaler representatives. The course of study is planned to teach heating service men more about air conditioning. Students learn by doing, are required to strip and re-assemble the electrical and mechanical controls of cooling units. Special attention is given to service work, and everyone has the opportunity to work on live equipment right in the school room. Heat gain calculation and installation procedures as well as short cuts are among the subjects covered in the week-long courses. Classes will be held Monday through Friday of the weeks beginning January 15, January 29, February 5, February 19, March 11, and March 18.

▸ MORE THAN 110 DEALERS and their servicemen heard John L. Zant, West Coast representative for Copeland Refrigeration Corp., discuss applications and trouble shooting on hermetic motor-compressors in a recent series of West Coast meetings. Thermal Supply Co. of Seattle and Yakima sponsored the two meetings in those cities while Thermo, Inc. acted as sponsor for the Spokane meeting. Mr. Zant has recently opened a new office in Pasadena, Calif. located at 557 E. Walnut St.

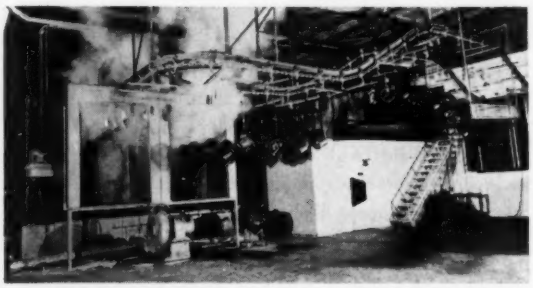
▸ THE EFFECT OF AIR CONDITIONING on residential construction was graphically demonstrated at the recent convention of the Texas Association of Home Builders held in Houston. Two model homes were erected on the lawn of the Shamrock-Hilton hotel — one a non-air conditioned home of the mid-twenties and the other a Carrier Corp. "Weathermaker" home, designed around air conditioning and incorporating other features to show the progress made in the home building field. Because ventilation was no problem in the air conditioned house, it offered the advantages of flexible design in contrast with the non-air conditioned home located next door, which required the use of sash windows in each wall, rooms located at each corner of the house for ventilation, and a long center hallway taking up living space.

▸ THE PERMAGLAS DIVISION of A. O. Smith Corp. has a $1,000,000 expansion program under way that is scheduled for completion by July 1957. Facilities are being added to the Kankakee works for the manufacture of a complete line of furnaces including 60 new oil and gas models. With the addition of the

OVER EVERY OBSTACLE and
AROUND EVERY CORNER with...
TRADE F. Dieckmann MARK
CONDUCTOR PIPE ELBOWS
One reason why roofers prefer Dieckmann elbows is the ease, speed and simplicity with which they can pass over and around every obstruction and carry water from roof gutters thru down spouts to outlet.
More than three quarters of a century ago Ferdinand Dieckmann designed and patented machines for making Dieckmann one-piece conductor elbows of all shapes, sizes, angles and metals.
Insist upon the Dieckmann trade mark.
THE FERDINAND DIECKMANN COMPANY
1180 HARRISON AVENUE
CINCINNATI 22, OHIO

## we hear that (Continued)

new units, the division will be producing a total of 82 models in both gas and oil fired types, ranging from 70,000 to 245,000 Btuh input ratings.



**BLOWER WHEELS receive their initial finishing treatment in a five-stage double tunnel bonderite machine**

▸ THE UTILITY APPLIANCE CORP. recently completed the erection of a 105,000 sq ft building adjoining its Los Angeles manufacturing plant. The expansion plans provided for the installation of a new finishing department, one of the features of which is a five-stage bonderite machine — a double tunnel unit with a clear opening 5 ft wide by 7 ft high on each side. Each tunnel is equipped with its own burners, controls, etc., so that they may be independently operated. According to the company, the new finishing department has resulted in a tremendous increase in capacity and has also effected improved finished quality and reduced costs. Features of the warehouse contained in the new building include a rail spur running its full length of approximately 280 ft as well as a 180 ft long truck dock. The entire warehouse is at dock height and the truck parking area is sloped to accommodate variations in dock heights of different truck models.

▸ FOR THE SEVENTH consecutive year, Crane Co. has sponsored a fellowship in the Foundation for Economic Education's College-Business Exchange program. The Foundation's plan is designed to give college and university teachers and graduate students a chance for an on-the-spot five week study of business. Seventy business firms and 92 colleges are cooperating with the foundation in its 1955 program.

▸ CONSTRUCTION has been started by Borg-Warner Corp. on a new research center located in Des Plaines, Ill. The new center will replace the central research laboratory now being operated at 706 S. 25th Ave., Bellwood, Ill.

▸ OWENS-CORNING FIBERGLAS CORP. has launched a two-year test program to determine whether an average sized home anywhere in the United States can be heated and cooled for an average of $10 per month. The test will be conducted on 100 to 125 homes in 20 cities in various climatic zones. The houses to be

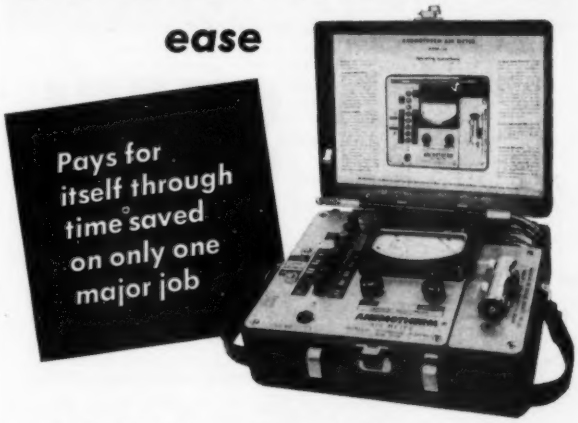

**NEW**

**Anemotherm Air Meter**

***gives you all vital readings with***

**PUSHBUTTON**

***ease***




The Model 60 Anemotherm Air Meter, developed by the Anemostat Corporation of America, gives you—*in one convenient instrument*—a simple, rapid method of balancing and checking any air system. It puts at your fingertips, by means of *color-coded pushbuttons*—

**Air Velocity**

Measures air velocities from 10 to 8,000 fpm, in increments as small as 5 fpm—a wider velocity range than ever offered before. It is essentially non-directional.

**Air Temperature**

Provides rapid-response measurement of temperatures from 0 to 255F. Temperatures can be read with an accuracy of one-half of one degree.

**Static Pressure**

Measures static pressures directly in terms of inches of water, from 0" to 10" wg. positive or negative, with a sensitivity of better than .05" at lower range.

*The new Anemotherm Air Meter saves time and money. Write for Bulletin 55 giving all essential data.*

AC 1336

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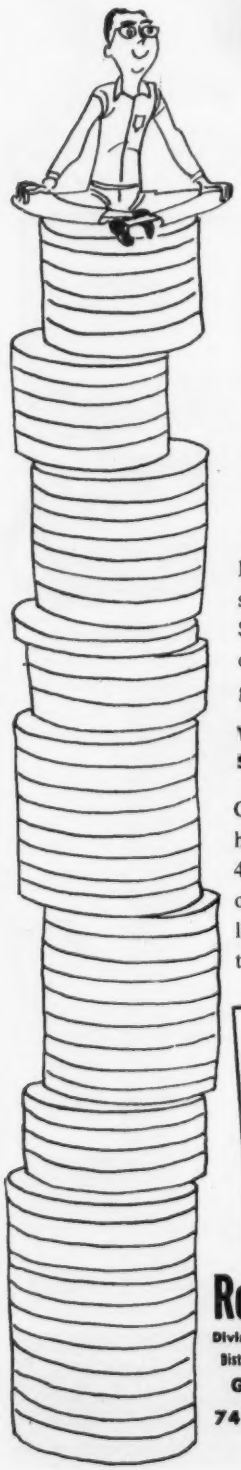
MANUFACTURERS OF
ANEMOSTAT DRAFTLESS Aspirating AIR DIFFUSERS

# SAVE MONEY ON STEEL



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Make tremendous savings on all steel costs by ordering from ROLLED STEEL PRODUCTS. We carry a complete stock of sizes, types and gauges for all manufacturing needs.

**YOUR UNCONDITIONAL SATISFACTION IS GUARANTEED!**

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**300,000 pounds, 26 ga.**
**Prime galvanized (stained)**
**30" x 120"**
**$8.95**
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**Division of Emergency Steel Service Corporation**
**Distributors of: SHEETS—PLATES—BARS—STRUCTURALS—STRIP**
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**ORchard 3-7400**


## we hear that (Continued)

tested will range in price from $10,000 to $25,000 and in air conditioned floor area from 900 to 1500 sq ft.

▶ THE O. A. SUTTON CORP. provided the air conditioning units for 300 homes in the Glasgow Village (St. Louis) housing project. Builder C. T. Wilson states "I believe that any builder who wants to keep up volume sales and production will begin right now to include central air conditioning as standard equipment in every home he builds."

▶ A $4,400,000 EXPANSION PROGRAM is now under way at the Kankakee works of A. O. Smith Corp. The program is scheduled for completion in the latter part of 1956 and will result in the addition of 270,000 sq ft of additional manufacturing and storage space, increasing the present area by over 50 percent.

▶ MINNEAPOLIS-HONEYWELL REGULATOR CO. has won a top award in the "Best of Direct Mail Advertising" competition sponsored by the Direct Mail Advertising Association. The award was given for the company's direct mail advertising of its electronic moduflow temperature control system during 1955.

▶ SIEGLER CORP., Chicago manufacturer of heating equipment, has contracted to buy Holly Mfg. Co., Pasadena, Calif. manufacturer of wall type furnaces.

▶ MORE THAN 2500 U. S. salesmen and their wives recently flew to Montego Bay, Jamaica, for expense-paid vacations in a sales contest sponsored by Fedders-Quigan Corp.

▶ THE ADDITION to the Buffalo, N. Y. plant of Joseph T. Ryerson & Son, Inc., which will increase by almost 50,000 sq ft the former plant and office space, is nearing completion and is expected to be finished late this year or early 1956. The curtain wall being used in the construction utilizes an inner sheeting of galvanized corrugated carbon steel, a core of 1 in. thick rigid insulation board, and an outer sheeting of stainless steel.

▶ BRUCE D. HENDERSON has been named operating vice president and division manager in charge of the air conditioning division of the Westinghouse Electric Corp. John A. Gilbreath, who has been manager of the plant at Staunton, Va., will become manager of the packaged products department of the division, a new position which carries responsibility for the production and marketing of most of the products manufactured at the Staunton plant. As the executive in charge of all operations of the division, Mr. Henderson succeeds H. E. Seim, Westinghouse vice president, who has been in charge of both the air conditioning and the Sturtevant

divisions. Mr. Seim will now devote full time to the operations of the Sturtevant division at Boston. The sales department of the Sturtevant division has been reorganized into seven new regions. Serving as field sales manager responsible for all regional sales activities of the division will be Alexander Martin. In new regional posts are Robert Mercer as northeastern regional manager, with headquarters in New York City, and Hiram W. Rainey, Jr., as central regional manager, with headquarters in Pittsburgh.

▸ MARK J. LACEY, president of The Peck, Stow & Wilcox Co., was elected president of the American Hardware Manufacturers' Association at its recent convention held in Atlantic City.

▸ THE AIRTEMP DIVISION of Chrysler Corp. is working on an expansion program which will cost in excess of $2 million. The immediate program will include a new $1,500,000 production line for the manufacture of air conditioner compressors, a $250,000 plant addition, a $180,000 tooling job to produce a new line of furnaces for low cost homes, and $180,000 for the retooling of existing air cooled air conditioner production facilities.

The division has greatly enlarged its sales and service training program and has appointed an assistant training manager, two technical training supervisors and four field training supervisors to carry out the expanded program. "During the next 12 months, we plan to conduct a minimum of 100 major training schools throughout the country," states J. A. Clarke, manager of sales training. "The schools will be held in the field, at the headquarters of our distributors."

▸ THE UNION ASBESTOS & RUBBER CO. recently concluded a series of three regional seminars for its sales representatives — one in Chicago, one in New Orleans, and the third in Atlantic City. Representatives from 26 midwestern and far western states as well as Canada attended the Chicago seminar; 10 southern states were represented at New Orleans; and 12 eastern seaboard states were represented at the Atlantic City meeting. According to Peter B. Colwin, assistant general sales manager of the heating and cooling division, a total of approximately 200 people previewed the company's 1956 line of heating and air conditioning products. Mr. Colwin noted that minor changes had been made in four residential air conditioners recently introduced to the industry. Speaking at the closing session of the Chicago meeting, Edwin E. Hokin, president, said that despite the rise in sales of air conditioning equipment in the past two or three years, "the surface of the market has only been scratched." He predicted that by 1965 more than 60 percent of all homes would be air conditioned.


**Only WALKER Has It!**

**Automatic Draft Control with**
**Full Protection at All Vital Points!**

Pat. Pending

**Royal Purple Model**

Think of it! A draft control that's absolutely impregnable to soot, carbon, corrosion and dust . . . one that will give years of accurate, trouble-free service in spite of the most adverse operating conditions! The new Walker ROYAL PURPLE model is the first—and only—draft control with positive, all-point protection. These revolutionary improvements can't be copied or duplicated — they're exclusively Walker because of pending patents.

*The Royal Purple — Hit of the Philadelphia Show*

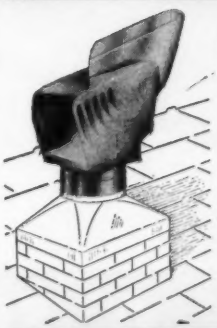
**THE INSIDE STORY**

The weight adjustment assembly on the ROYAL PURPLE model is sealed in by a protective housing which keeps mechanism absolutely free from dirt deposits. Untouched photo at right shows back of vane and housing after more than a year's service. Cutaway shows spotless condition of sealed-in weight adjustment assembly. Clean, corrosion-free operating parts assure ease of adjustment at any time.

This front view of an actual installation shows location of pivot pins which control vane movement. Notice how they are located on front face of damper and set back, away from edge. Box-type hinges completely seal delicate knife-edge pivots, keeping them clean and sensitive even after years and years of service.

For complete details on this sensational new development in draft control, see your jobber or write Walker Manufacturing and Sales Corporation.

Another Outstanding Walker Development
**VENTURI-TOP CHIMNEY CAP**



Ideal for both heating (gas, oil or coal) and ventilating applications. Directional vane keeps throat of vent facing into wind for maximum draft control. Sloping-throat design prevents back drafts and actually increases draft effectiveness by constricting it as it passes over chimney opening. Unit rotates on a friction-free, hardened-steel ball bearing. Pivot is also of hardened steel to assure lifetime operation. Ring guide bearing in pivot post keeps cap absolutely perpendicular—doesn't sag or lean. Streamlined design is both attractive and functional — a combination which makes it a favorite with today's architects.

**Walker Manufacturing and Sales Corp.**

1730 Penn St. St. Joseph, Mo.

## *wholesaler doings . . .*

▶ BUSSER SUPPLY CO., Lewisburg, Pa. was one of the exhibitors at the recent Bloomsburg (Pa.) fair. The booth featured a warm air baseboard display showing equipment manufactured by the Thermo-Base division of Gerwin Industries. Also on display were heating and cooling products of the Armstrong Furnace Co., Rheem water heaters, and Yardley plastic pipe and fittings. A number of active prospects were developed by the Busser company at the fair, which were turned over to the dealers in their respective territories. This is the third year the company has displayed products at the Bloomsburg fair, and it reports that dealers are very appreciative of its efforts in preselling merchandise.

▶ A SURVEY recently conducted by the Central Supply Association reveals that fringe benefits for employees of heating equipment wholesalers are currently averaging at least 25 percent of base pay and are increasing faster than the base pay rate. Also brought out by the survey was the fact that good will payments (for coffee breaks, relief time, etc.) are costing wholesalers approximately 15 cents per hour. Another major item in fringe benefit payments is the cost of sick days, time not worked, and vacations, amounting to approximately 5 percent of base pay.

▶ ELLIOTT-LEWIS DISTRIBUTORS INC. of Philadelphia has been appointed a wholesaler of packaged air conditioning units by the Worthington Corp.

▶ MORE THAN 3000 visitors attended the open house celebration held recently by the Metal Goods Corp. at its new office and warehouse, 8800 Page Blvd., St. Louis. According to Robert E. Grote, president, the new facilities were needed to meet a 400 percent increase in business in the St. Louis area during the last 10 years.

▶ R. E. GRAY has been named vice president of Harry F. Haldeman, Inc. of Los Angeles, southern California distributor for the United States Air Conditioning Corp. Mr. Gray was formerly sales manager for the Haldeman company, which he joined in 1950.

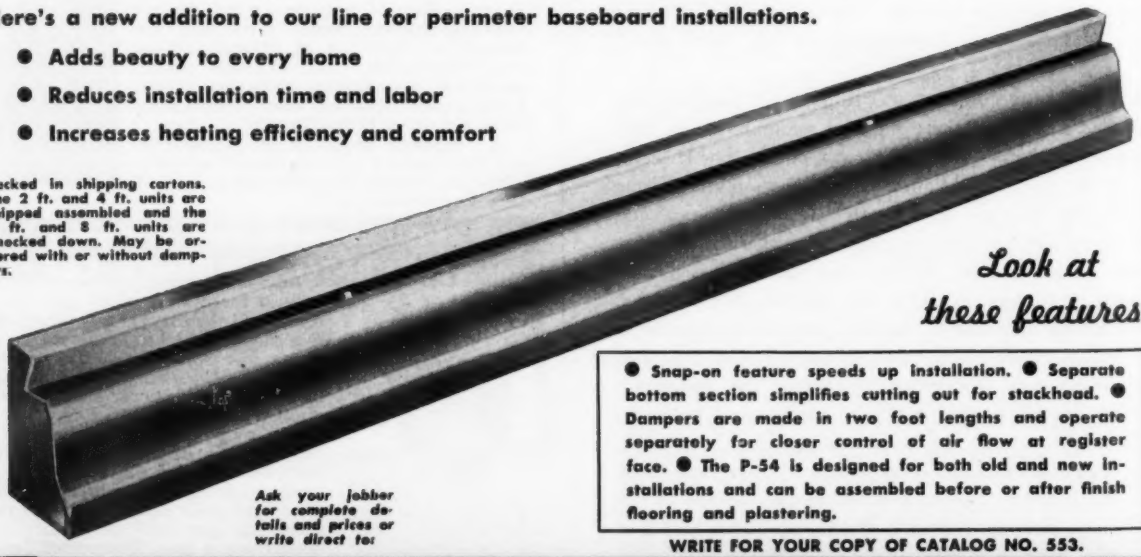
▶ DEMMLER BROS. CO., Pittsburgh wholesaler, reports that almost all its employees went to the Pitt stadium recently and saw Pitt triumph over Nebraska on the gridiron 21 to 7. Lou Demmler, president of the firm, officiated at the game.


*For greater heating efficiency and savings specify this* **NO. P-54 BASEBOARD DIFFUSER**

**Here's a new addition to our line for perimeter baseboard installations.**

- **Adds beauty to every home**
- **Reduces installation time and labor**
- **Increases heating efficiency and comfort**

**Packed in shipping cartons. The 2 ft. and 4 ft. units are shipped assembled and the 6 ft. and 8 ft. units are knocked down. May be ordered with or without dampers.**



*Look at these features:*

● Snap-on feature speeds up installation. ● Separate bottom section simplifies cutting out for stackhead. ● Dampers are made in two foot lengths and operate separately for closer control of air flow at register face. ● The P-54 is designed for both old and new installations and can be assembled before or after finish flooring and plastering.

*Ask your jobber for complete details and prices or write direct to:*

**WRITE FOR YOUR COPY OF CATALOG NO. 553.**

**THE A & A REGISTER COMPANY**
**8327 CLINTON RD. . CLEVELAND 9, OHIO**

# *merchandising ideas*

A MEMBER of the showroom staff explains the features of a lowboy gas furnace

▸ THE RHEEM MFG. CO. has found that one good way of bringing its equipment to the attention of the public is by working with the public utilities. The company is currently maintaining a display of gas furnaces on the first floor of the Michigan Ave. headquarters of Peoples Gas Light and Coke Co., Chicago, where visitors can examine the units and get an idea of the various models of furnaces now available from the Rheem firm.

▸ A CHRISTMAS SEASON water heater campaign has been launched by Crane Co. The campaign features the free installation of certain Crane gas water heaters purchased for replacement. Supporting material, furnished without charge to dealers who purchase a display heater, includes paper cut-outs, window streamers, imprinted envelope enclosures, sample gift certificates and newspaper ads, Christmas wreaths, and radio and TV script suggestions.

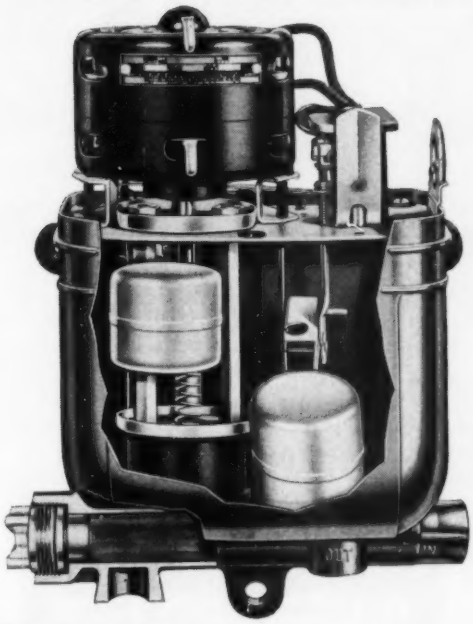
▸ THE HEIL CO. has recently introduced two assortments of small, self-adhesive "show cards" which may be applied directly to equipment on display. Each piece illustrates and describes a specific feature of the unit being displayed.

▸ THE LIMA REGISTER CO. has developed a display panel for showing diffusers and registers. Nine products are furnished with the display, already fastened to the panel and arranged so that prospects can operate dampers and check construction features. A literature rack is also included.

▸ DEALERS of the Majestic Co., Inc. may purchase work garments and uniforms for service personnel which feature the Majestic emblem together with the dealer's name and address.

▸ A THREE COLOR counter display which holds an actual humidifier and a length of the plastic tubing used to connect the unit to warm air furnaces has been prepared by General Filters, Inc. for use in jobbers' and dealers' show rooms. Dimensions of the display when installed are 14 × 20 × 10 in. The


BIG LIFT
for heating plants with a remote tank



Only Model 356
A-P OILIFTER
offers your customers all these features

Oilifter lifts fuel oil from basement or remote storage tank — to the first floor, second floor, or *as much as 25 feet away from heating appliance.* Feeds and keeps one or more oil burning appliances supplied at all times. Operates *automatically!* Check these additional features:

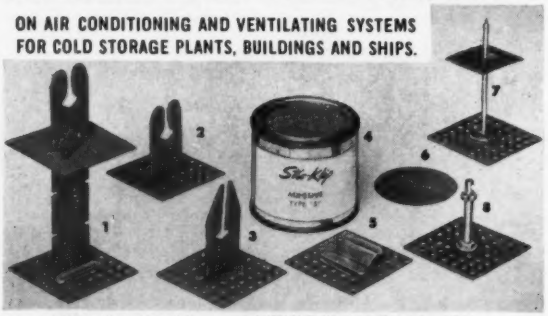
- **Complete freedom from fuel handling and spillage** — no waste.
- **Simple to install** — Mounts with 3 screws. Only one ¼" O.D. copper tube needed.
- **Simple to operate** — Turn on at beginning of season—no further attention. No radio or TV hum.
- **No overflow** — Safety float protects against overflow. Built-in strainer traps dirt.
- **Pumps No. 1 or 2 fuel oil** — 3 gph at 25 ft. lift and 4½ gph at 10 ft. lift.
- **Listed by Underwriters' Laboratories** — Guaranteed by A-P Controls Corporation.

**Order from your distributor, or write:**

for Air • Liquids • Gases • Refrigerants
DEPENDABLE Controls
A-P CONTROLS CORPORATION
2452 N. 32nd Street, MILWAUKEE 45, Wisconsin
COOKSVILLE, Ontario NIJMEGEN, Holland
For Export: 13 E. 40th Street, New York 16, N. Y., U.S.A.

Use Stic-Klip® for
Insulation Installation

ON AIR CONDITIONING AND VENTILATING SYSTEMS
FOR COLD STORAGE PLANTS, BUILDINGS AND SHIPS.



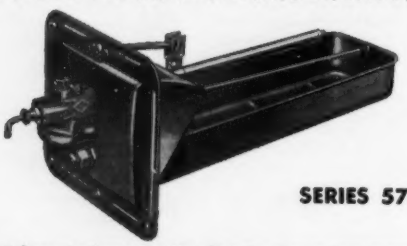
1 TYPE B with Locking Plate
2 TYPE B
3 TYPE A
4 TYPE S ADHESIVE
5 SPRING TUBING CLIP (¼" and ⅜")
6 HOLDING PLATE used with Type A and B
7 TYPE N with Speed Washer
8 INSERT BASE Securing Signs, Wall Cabinets, etc.

Stic-Klips permanently bind almost any insulating material to masonry, wood, metal — flat, corrugated, curved, unusual-shaped. This modern method eliminates drilling, puncturing metal — saves time and money.

*For illustrated booklet on any of these applications, write Dept. AA*

Stic-Klip MANUFACTURING CO.
52 Regent St., Cambridge 40, Mass.

COMPLETELY ASSEMBLED
Vaporite
AUTOMATIC HUMIDIFIER
OFFERS QUICKEST – FASTEST INSTALLATION
ADJUSTABLE TO SLOPING OR STRAIGHT
BONNET FURNACES



SERIES 577

Stainless steel construction. Drip-feed puts just enough water in pan for fastest vaporization. Eliminates scum . . . no stagnant water pan.

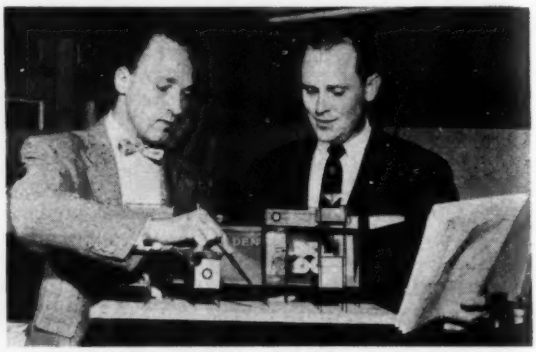
Pre-assembly cuts labor time and costs. To install simply cut hole in plenum wall, slip VAPORITE in just as it comes from shipping package.

Get complete information. Write. A-12.

**Automatic Humidifier Co.**
CEDAR FALLS, IOWA

## merchandising ideas *(Continued)*

unit, backed by a large illustration of a furnace, appears to be mounted in its normal position on the furnace jacket.



JOHN ELFSTROM, advertising manager of Utility Fan Corp., and Vance Smith, general manager, examine a model of the company's new blower display

▸ A NEW TYPE of display for products of the Utility Fan Corp. has been built for showings throughout the country. The display is 20 ft long, was designed to be easily disassembled for shipment. It shows the company's "Sy-Lent" direct blower and two other standard blowers in operation. Also shown are a four-way blower and "Im-Pak" (interchangeable mounting) blower.

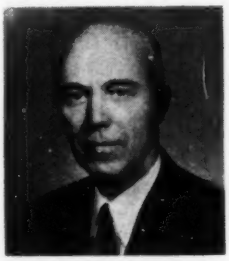
▸ THE CARLIN CO. is using a mailing piece illustrated with cartoons and blown up photos to notify its oil heating wholesalers that it is now conducting operations in new and larger quarters. The broadside points out how the new facilities make it possible for the company to speed up the handling of orders and to offer additional services to its customers.

▸ THE STRAUS-FRANK CO. of Dallas, wholesaler for the Worthington Corp., reports that its "Operation Roadshow" — a rolling display of packaged air conditioning equipment — is beginning to show results in sizable orders. Mounted on a 45 ft tractor-trailer, the display is taken to dealers in the organization, prospective dealers, and also to contractors on building project sites. Some of these visits have resulted in orders in carload quantity, according to Edward W. Norwood, sales manager of the Straus-Frank Co.

▸ THE AIRTEMP DIVISION, Chrysler Corp., recently sponsored a display of the company's air conditioning and heating products at the 1955 Dallas State Fair. The exhibit included summer and winter residential air conditioning systems, air and water cooled packaged air conditioners for commercial application, and the company's recently introduced "V-type" cooling coils.

# *appointments . . .*

▸ F. LOWELL CURTIS as Greater New York district sales manager for Century Engineering Corp. Mr. Curtis will promote the company's gas and oil heating and cooling equipment.



F. Lowell Curtis

John F. Griffey

▸ JOHN F. GRIFFEY as district sales manager in the eastern territory for Sundstrand Hydraulic division of Sundstrand Machine Tool Co. Mr. Griffey has been with the company for the past eight years. In his new position he will supervise sales in New England, eastern New York, New Jersey, eastern Pennsylvania, Maryland, Delaware, Virginia and North Carolina. Assisting him will be James F. Nelson, who has been working in the company's home office at Rockford, Ill.

▸ J. L. MILLER as sales manager of Tri-A-Lium Products Co., manufacturers of aluminum baseboard for perimeter heating.

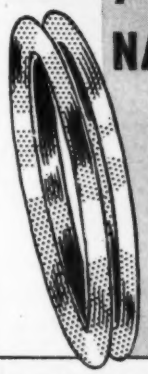
▸ T. REID MACKIN as special representative for G. W. Berkheimer Co., Indiana wholesalers. Mr. Mackin was formerly Midwest sales manager for International Heater Co. with headquarters in Chicago.

▸ DUNCAN HENDERSON as administrative assistant in charge of sales for A-P Controls Corp. Robert W. Sloane, formerly handling the company's field engineering projects, is now responsible for sales engineering in heating sales of gas and oil controls. Appointed technical staff advisors in heating sales are Stanley Burghduff, formerly with the Defense Plant Corp., and John Rice, former head of the company's gas laboratories.

▸ B. J. GILL as northwest district manager of Century Electric Co. Providing warehouse stock to customers in Idaho, western Montana, Oregon and Washington, Mr. Gill will work out of a new district office in Spokane.

▸ RAYMOND PETERSEN as manager of the newly created combined customer service department of L. O. F. Glass Fibers Co. Mr. Petersen was with Libby-Owens-Ford for 11 years and before that was self-

One Ring—
or thousands . . .
you'll **Gain More** with
**NATIONAL Angle Rings**



If you haven't worked with rings rolled by National, you're due for a pleasant surprise . . . for these true rings, guaranteed to fit your job, are:

1. **Accurately rolled with uniform curvatures.**
2. **Easy to fit on the job.**
3. **Punched with the bolt or rivet holes you need.**
4. **Available in the metals you use — carbon steels, stainless steels, aluminum, etc.**
5. **The best value at the best price.**
6. **Ready for immediate delivery in leg out rings in many sizes.**

**National rolls to your specifications — angles, channels, tees, rods, flat-bars, pipe and tube —plain, or punched for riveting or bolting.**

Tens of thousands of National rings have been used in all parts of the country by large and small sheet metal shops. They are rolled by experts on the most modern high-speed equipment to give you a precision ring at the lowest cost. Write today about your requirements, and the National list of stock sizes and quantity discounts.

**Sheet metal fabricating and assembly work is another National specialty organized for YOU. Use it as your stand-by facility.**

**Phone — Bishop 7-4255**

**NATIONAL METAL FABRICATORS**

**2142 S. Sawyer Avenue • Chicago 23, Illinois**

**Cut ANY Shape in Metal...**

**with a BEVERLY THROATLESS SHEAR!**

- Capacities to 3/16" in mild steel
- Make clean, knurl-free cuts in any metal to capacity
- High Carbon High-Chrome Blades
- Built to last a lifetime

*Here's What a Beverly Can Do!*

Cuts made in 18 ga. metal with Model B-1

Model B-3 with Ball Bearing Hold Down

Beverly Shears are the most versatile metal shearing tools you can use. Unique shoulder design permits any cut . . . rack and pinion gives great power with little effort. Alloy steel body for maximum rigidity and strength. Made in 4 models.

*Write for illustrated circular —or see your Beverly Distributor.*

**Beverly SHEAR MFG. CO.**
3020 W. 111th Street Chicago 43, Ill.

**W. A. WHITNEY LEVER PUNCHES**

*For Every Shop and Tool Box*

*Also supplied with three punches and three dies in a cardboard carton*

**No. 4B Punch**
**All parts drop-forged.**
**Most sturdy punch built for size.**
**Capacity — 1/4" hole through 16 gauge metal**
**Length — 8 1/2" Depth of throat — 2"**
**Weight — 3 lbs. Stock size punches 1/16" to 9/32" by 64ths.**
*Write for catalog —then contact your jobber.*

**W.A. WHITNEY MFG. CO.**
**636 RACE ST. ROCKFORD, ILL.**


## appointments (*Continued*)

employed for ten years. Working with Mr. Petersen as customer service assistants will be George C. Arnold, A. J. White, John M. Vaneslow and William F. Moll, Jr.

▸ JAMES F. MCENTEE as manufacturer's representative for the Mammoth Furnace Co. Based in New York, Mr. McEntee will cover Manhattan, the Bronx, Westchester County and northeastern New Jersey.

▸ JOHN M. MCGRAW as sales representative in eastern Kentucky and Tennessee of Inland Steel Products Co. Mr. McGraw is assigned to the company's Cincinnati branch.

▸ R. R. ROUTH, JR. as manager of advertising and sales promotion for the General Electric Co.'s home heating and cooling department. Mr. Routh previously held a similar position with the Carleton-Stuart Corp., distributor in the New York metropolitan area for the Carrier Corp. Norman R. Austin has been appointed distribution planner for the department's marketing unit. Prior to joining GE, Mr. Austin was vice president and general manager of an automobile sales agency. A newly franchised dealer of the department's heating and cooling equipment is the Gem City Heating and Supply Co., Quincy, Ill.

R. R. Routh, Jr.

James Hughes

▸ JAMES HUGHES as supervisor of advertising and sales promotion for residential air conditioning and heating for the Airtemp division of Chrysler Corp. Prior to joining the division, Mr. Hughes was assistant sales promotion manager for the Armstrong Furnace Co. Robert E. Nutting has been named district manager of the Detroit sales office. Until his recent appointment he was product manager for the Modine Mfg. Co. He has been associated with the heating and air conditioning industry in engineering and sales capacities since 1939.

▸ J. M. GLEASON as sales manager for the Williams division of Eureka Williams Co. Mr. Gleason joined the company in 1950 and before his recent appointment served as assistant sales manager for the division. In his new post he will direct nationwide market-

## appointments (Continued)

ing of the company's home heating products. The division has recently established three new regional sales territories — the Rocky Mountain, the western, and the midwestern regions. Frank Mills, who has been on the field sales staff in Iowa, will become manager for the Rocky Mountain region, with responsibility for Iowa, Missouri, Nebraska, Kansas, North and South Dakota, Minnesota and Colorado. He will headquarter in Cedar Rapids, Ia. Pete Obee, who has been on the field sales staff in the Pacific Northwest, will be manager of the western region, covering Washington, Oregon, Montana, Idaho, Utah, Wyoming, Nevada and northern California. He will have headquarters in Portland. C. G. Branch, who has been on the company's executive sales staff, will be manager of the midwestern region, with a territory comprising Illinois, Wisconsin, Michigan, Indiana, Ohio and Kentucky. His headquarters will be in Bloomington. All three appointments become effective January 1.

▸ HAROLD J. BARNES as a member of the residential sales staff of Carrier Corp.'s Unitary Equipment division. Mr. Barnes reports to William A. Lake, residential sales manager.

▸ C. ADRANCE MONTAGUE, formerly general sales manager for the Kalamazoo Furnace & Appliance Mfg. Co., as manager of residential air conditioning sales for York-Shipley, Inc.

▸ DON C. ZINTER as general sales manager of the Berger Furnace Corp. Previously, Mr. Zinter held similar positions with Besser Metal Products Corp. and the Adams Mfg. Co. and has also served as Cleveland district manager for White-Rodgers Electric Co. Harold D. Stoffy has been appointed a field representative for the company to cover the state of Ohio. Other new field representatives are H. G. Riley, Jr. and H. G. Riley, Sr., both of whom will represent the company in Indiana, and William Schonfeld, who will cover the state of Michigan.

▸ S. BYRON STONE as advertising and sales promotion director of the Typhoon Air Conditioning Co., Inc., succeeding Peter T. Wotton.

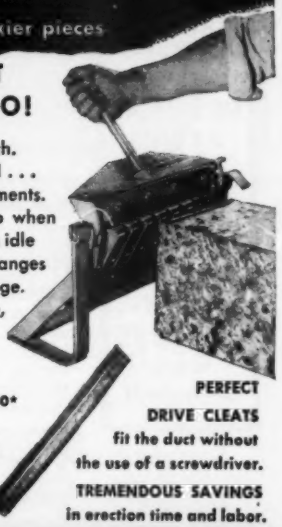
▸ STEWART H. KIBBE as sales training director of Iron Fireman Mfg. Co. Mr. Kibbe, who had previously held the same position, returns to the company after a period of service with the Army Signal Corps. He originally joined the firm in 1934. Five new field men have been added to the organization. They are Stanley F. MacMichael, formerly president of Air Industries, Inc., who will act as district sales manager for the eastern half of Ohio; William H. Schrum, who will cover the eastern part of Pennsylvania;


FLANGES THE DUCT with Amazing Speed!

Less than 5 seconds on short and lighter pieces . . . Slightly longer on bulkier pieces

MAKES PERFECT DRIVE-CLEATS TOO!

The ONLY tool that does both. A complete drive cleating tool . . . no set-up time . . . no adjustments. Handy to take out to the job when not needed in the shop. Turns idle time into production time. Flanges any square duct up to 20 gauge. Quickly pays for itself in time, material and labor savings.



No. 12 Smith's Cleat Bender (12" wide) . . $49.80*

No. 18 Smith's Cleat Bender (18" wide) . . $78.60*

*F.O.B. Waukegan, Illinois Prices subject to change without notice

PERFECT DRIVE CLEATS fit the duct without the use of a screwdriver.

TREMENDOUS SAVINGS in erection time and labor.

R. E. SMITH

1124 Elizabeth Avenue • Waukegan, Illinois

FOR SOUND ECONOMY

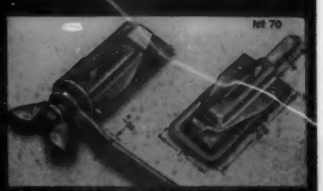
H&C

KWIK-WAY DAMPER REGULATOR SETS

No. 69 SET SINGLE BEARING for SMALL DAMPERS

Retractable bolt and quick, easy means of fastening bearing are among features that make this the most convenient and economical set available.

ONE BLOW SETS BEARING SECURELY




No. 70 SET for LARGER DAMPERS

Identical with No. 69 except with 2 retractable bolt bearings.

HART & COOLEY MANUFACTURING CO.

500 EAST EIGHTH ST., HOLLAND, MICH.

THERE WERE FEW SWIMMERS AT THIS POOL ... until Delta OIL UNIT HEATERS were installed!

**PROBLEM:** An inadequate heating system left this glass enclosed pool chilly, uncomfortable, and unpopular in cool weather.

**SOLUTION:** A compact and attractive Delta Oil Fired Unit Heater was suspended in each corner, overhead and out of the way. These units need no boiler or chimney — and there are no unsightly pipes, valves and fittings to mar the view. Delta's powerful heat blankets the entire area.

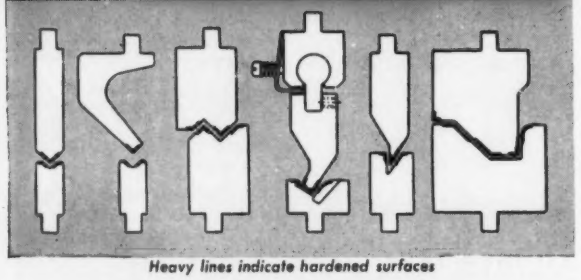
**RESULTS:** No matter what the weather, the pool is now always crowded with bathers relaxing in luxurious warmth and comfort.

*Send for complete new catalog H*

This is only one of hundreds of jobs that a Delta OIL Unit Heater can do better and more economically.

**DELTA HEATING CORPORATION**
TRENTON 8, NEW JERSEY

CHICAGO INDUCTION HARDENED PRESS BRAKE DIES



*Heavy lines indicate hardened surfaces*

**for greater die life — at no extra cost — on any make press brake**

Whether it is a simple die for angle bending or the more complex dies for any of the combined bending and forming operations, CHICAGO induction-hardened dies offer bonus performance at no extra cost. Field reports on these dies show better than ten times the useful life of the conventional dies used in press brakes. Get the full particulars on CHICAGO induction-hardened dies for your next press brake job.

Steel Bending Brakes For Over Fifty Years 4901

DREIS & KRUMP MANUFACTURING COMPANY
CHICAGO
7404 S. Loomis Blvd., Chicago 36, Ill.

## appointments (Continued)

Donald O. Spicer, who will handle sales for the company's Indianapolis wholesale operation; Howard Misfeldt, who will serve as district sales manager for Nebraska and South Dakota; and William D. Burk, who has been assigned a territory comprising Alaska and the Yukon territory.

▸ GEORGE W. CRAWFORD as assistant sales manager of the Punch Products Corp. He is located at the company's general offices in Niagara Falls, N. Y.

▸ NAPIER B. CALDWELL as sales manager for the Boston plant of Joseph T. Ryerson & Son, Inc. Succeeding Mr. Caldwell as manager of tubular products and cold finished steel bar sales is Joseph A. Moran, formerly a sales representative. Mr. Moran has been with the company since 1930; Mr. Caldwell, since 1935.

▸ ROBERT K. ESKEW as product director for year 'round air conditioning at Servel, Inc. One of the first members of Servel's air conditioning organization, Mr. Eskew has been with the company for 22 years.

▸ RICHARD E. HEAVEN as regional sales manager of the Thatcher Furnace Co. Mr. Heaven's territory will be eastern Pennsylvania, Washington, D. C., Virginia, Maryland, North and South Carolina and Delaware.

▸ NORBERT F. EICHELSBACHER as vice president in charge of manufacturing for Trion, Inc. Treasurer of the company since 1947, Mr. Eichelsbacher has also headed manufacturing during the past two years.

▸ FRANK D. KLEIN and Henry Rollens as southwest and northeast regional sales managers, respectively, of the United States Air Conditioning Corp. Mr. Rollens' territory comprises New England, New York, northern New Jersey and western Pennsylvania. Mr. Klein's territory covers Texas, New Mexico, Colorado, Oklahoma, Arkansas, Louisiana and western Tennessee.

▸ JOHN T. OBRIG as eastern regional sales manager and William G. Huston as western regional sales manager of Union Asbestos and Rubber Co's. heating and cooling division. Mr. Obrig has been in the air conditioning field since World War II, while Mr. Huston has been in the field for over 30 years.

▸ DARWYN I. BROWN as assistant to the president of Washington Steel Corp. Mr. Brown is known for his articles in Iron Age, of which he is a former editor.

▸ A. W. BARR as eastern regional sales manager for Penn Controls, Inc. Mr. Barr will have headquarters in Philadelphia and will be responsible for sales activities

The MODERN Lighter Tube
*With the Slanting Blue Flame*

## Today's Great Contribution to Gas Appliance Safety and Dependability!

To safeguard all users of gas-fired heating equipment and appliances against hazardous lighting methods, more and more manufacturers are engineering the MODERN Lighter Tube into their units. Utilities and wholesalers too, strongly favor the MODERN Lighter Tube as a component part of all gas-fired units. Dealers recognize it as a vital sales feature. Available in aluminum or stainless steel ⅜ O.D. tubing.

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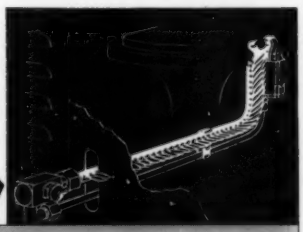

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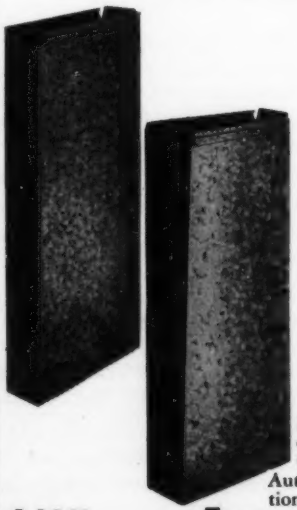

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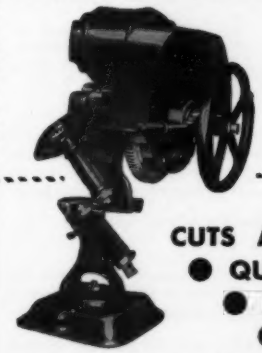

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Here's a shear that's right for every job. Speedy — efficient. Cuts up to ¼ inch stock — speed to 8 ft. per minute. Excellent for irregular cutting or straight splitting. Available in hand operated or motorized models. Prompt shipment. Send today for special illustrated bulletin.

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filters...
the best line
we could sell
says Norman R. Cole
of R. H. Case,
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*Ask your Jobber for the FloRite or write for Leaflet 760.*

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7301 PENN AVENUE—PITTSBURGH 8, PA.

## appointments (Continued)

in the firm's Philadelphia, Boston, New York and Rochester offices. James Garrett has been appointed district manager of the Boston office.

▸ E. N. Foss as manager and P. J. Zilles as sales manager of the air cleaning products department of the Sturtevant Div., Westinghouse Electric Corp. Mr. Foss has been with the company since 1934; Mr. Zilles, since 1925.

▸ Jules Alexandre as manager, northeastern division, for Mathes Co., Inc., a division of the Glen Alden Corp. Mr. Alexandre was sales manager, air conditioning, for Emerson Radio and Phonograph Corp.

▸ The Horton Co., 254 Prospect Ave., Hartford, Conn. as a retailer of "Weathertron" heat pumps in the Hartford area for General Electric Co. Moran & Co., 127 Franklin St., Bloomfield, N. J. will distribute heat pumps in the Essex county area. Mayo & Lytle, Inc., 334 Main St., Metuchen, N. J. will cover the territory comprising Somerset, Middlesex and Union counties.

▸ Gurdon R. Munger as an assistant to Tyler S. Rogers, technical consultant of Owens-Corning Fiberglas Corp. Mr. Munger is former technical secretary of the American Society of Refrigeration Engineers.

## Obituaries

### James West Galloway

James West Galloway, founder and president of the Automatic Humidifier Co., died in Cedar Falls, Ia. November 11, 1955. Mr. Galloway was well known for his pioneering in the field of humidification. Surviving are his wife, two daughters and three sons. Son Harold is vice president and son Roger, general manager of the company.

### Frederick E. Munschauer, Sr.

Frederick E. Munschauer, Sr., president and general manager of Niagara Machine & Tool Works, died October 22, 1955. He was 70 years old. Mr. Munschauer had long been active in the machine tool industry and was responsible for many developments and improvements in mechanical presses, shears and other sheet metal fabricating machines. Surviving is his son, Frederick E. Munschauer, Jr., vice president in charge of manufacturing and industrial relations for the Niagara company.

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LINE OF FORCED AIR FURNACES DESIGNED FOR SMALL HOMES:

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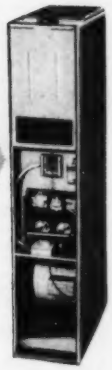
Comfortaire H.C. models produce abundant warmth, operate quietly, and are built to precise specifications. Draft diverter built into element allows extra heating surface.



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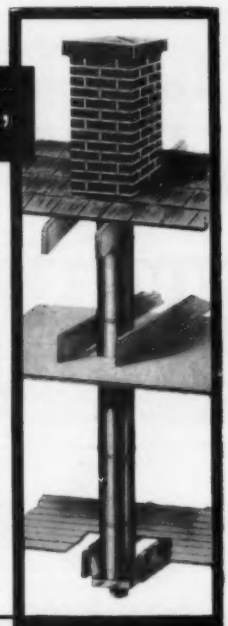

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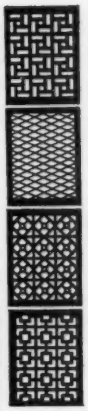

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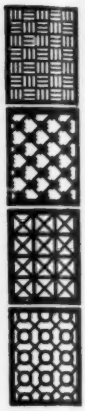

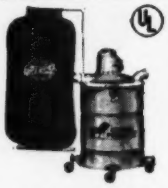

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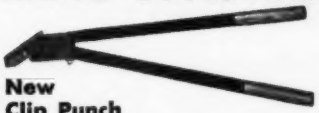

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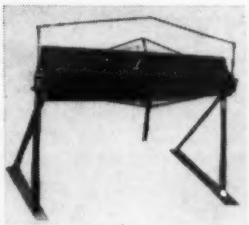

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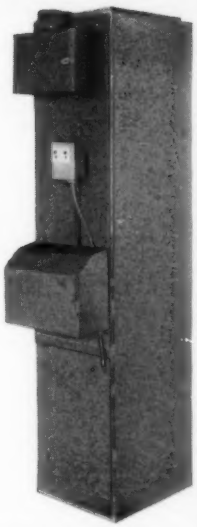

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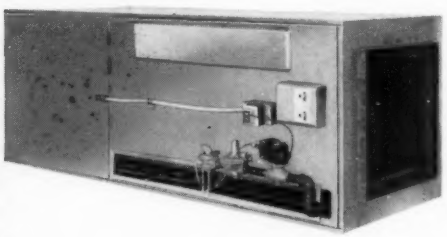

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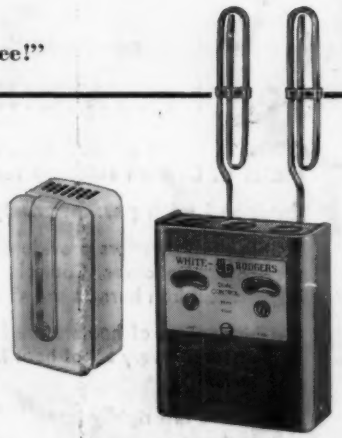

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